JUNE 24, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Another Lift for Capital Spending

'57 Outlays will hit $37.4 billion, up 6.5 per cent from '56's . . . page 84

- **How To Avoid Trouble with Stainless Welds . . . page 116**
- **New Seamless Steel Tube Mill Opens in Canada . . . page 159**

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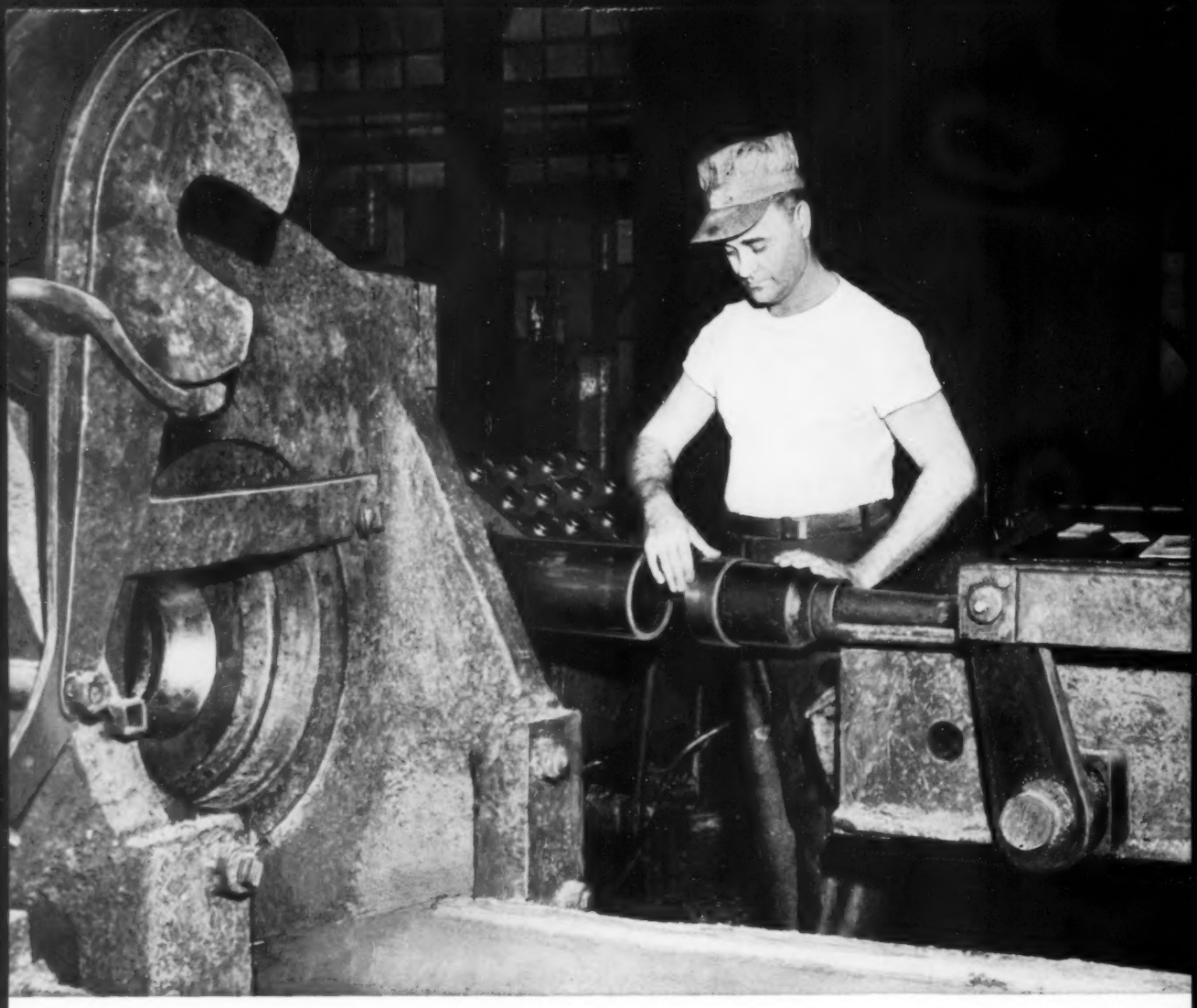


COLD-DRAWN TUBES AND BETTER FINISHES

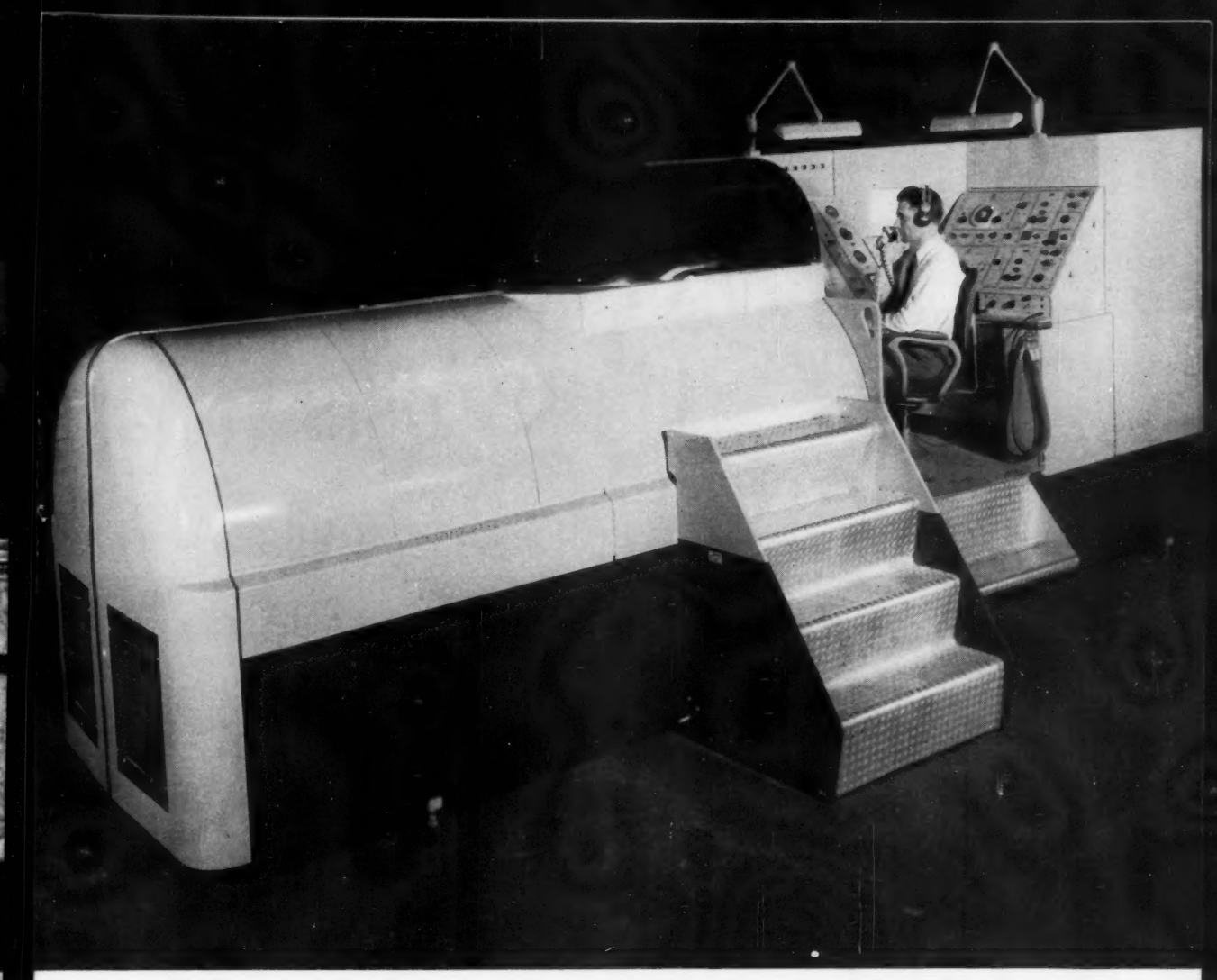
One of the many reasons why tubing is cold drawn is to obtain a better surface finish than it is possible to achieve as a hot finished tube. In the finishing of tubing by the cold draw process, any imperfection of the die or the mandrel is reflected in the product. Pick up on the mandrel, for example, can mar the inside surface of the tube.

Louis Friedel operates one of the many cold draw benches at B&W. Between every draw, his practiced eye makes sure his mandrel and die are in perfect condition. Years of experience in watching and making thousands of feet of B&W Cold Drawn Tubing enables him to exercise that judgment needed to tell what meets B&W's quality standards.

Many other men like Louis Friedel, generations of experience armed with the best equipment, put their knowledge into every foot of B&W Tubing. It's your assurance that the B&W Tubing you buy will meet your most exacting requirements. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA-6045-G6

Seamless and welded tubular products, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels.



This steel skin may save a flier's skin

This is the Link C-11B jet flight trainer, used throughout our armed forces for basic and transition training of jet fighter pilots. The instructor at right sets up problems in flight and radio navigation and relays them to the trainee, who is isolated from the outside world by a skin of Bethlehem cold-rolled sheet steel.

Link Aviation, Inc., also uses Bethlehem sheets in their trainers and flight simulators in the construction of mounts and brackets for the various electronic chassis. This application is one of the more interesting and important ones for which sheet steel is so admirably suited. Many of today's substantial uses of sheet steel were relatively inconsequential, tonnage-wise, as recently as a decade ago. Their amazing growth has greatly increased the sheet steel market.

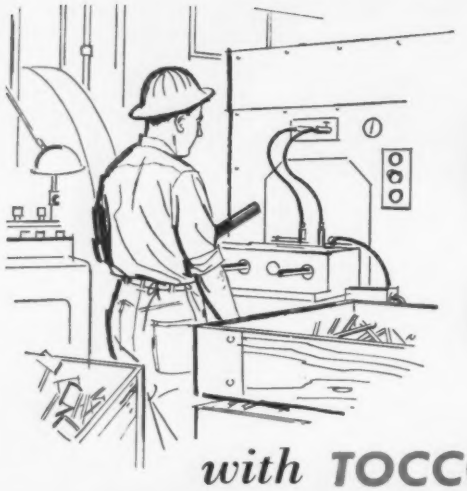
In view of the demand for Bethlehem hot- and cold-rolled sheets, since World War II, our mills at Lackawanna, N. Y., and Sparrows Point, Md., have steadily swelled their output. We would be glad to discuss your sheet requirements and work out a satisfactory schedule with you. A phone call or letter to our nearest office will start things moving.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

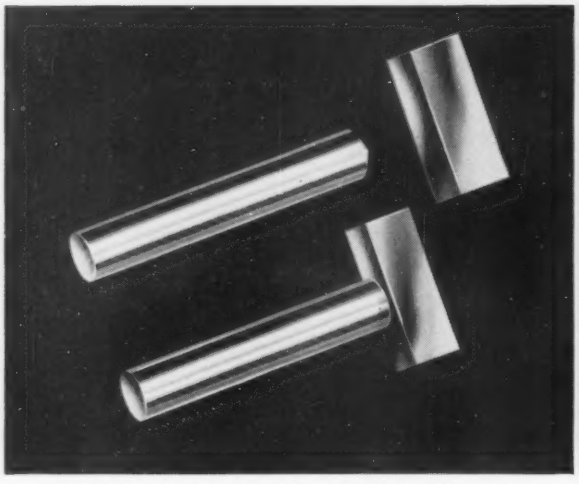
BETHLEHEM STEEL

BETHLEHEM STEEL

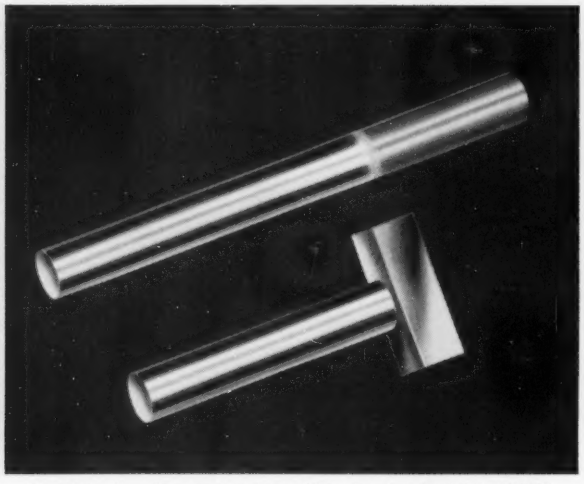


G.R.S. Cuts Costs 65%

with TOCCO* *Induction Heating*



Old Method — headpieces and shanks were butt-welded after shanks were pointed and both parts sandblasted.



New Method — relay cores are formed from barstock heated by TOCCO Induction Heating. No sandblasting or welding is required.

● When General Railway Signal Company converted from butt-welding to TOCCO Induction Heating to form this relay core, they not only produced a better product, faster—but saved money doing it.

Faster Production — A 75 kw, 10,000 cycle TOCCO unit heats 4⅝″ of this 9⅞″ long, ¾″ diameter silicon steel bar to 2100° F. for upsetting magnetic relay cores. 40 kw of high-frequency energy is used, producing 250 pieces per hour—nearly three times the production achieved by their former method.

Lower Cost — Formerly G.R.S. cut separate shanks and rectangular headpieces for this relay core. The shanks had to be pointed and both pieces sandblasted prior to butt-welding. Heating the blanks for forging with TOCCO saves nearly two-thirds the cost of this former method.

TOCCO is Flexible — The part shown is only one of nearly 300 that G.R.S. is heating for forging with TOCCO. Production runs vary from 15 to over 50,000 pieces.

It may pay *you* to investigate TOCCO as a sound method of improving product quality, increasing production and reducing costs.

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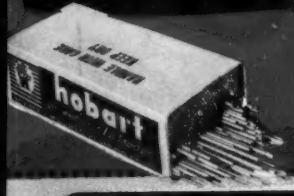

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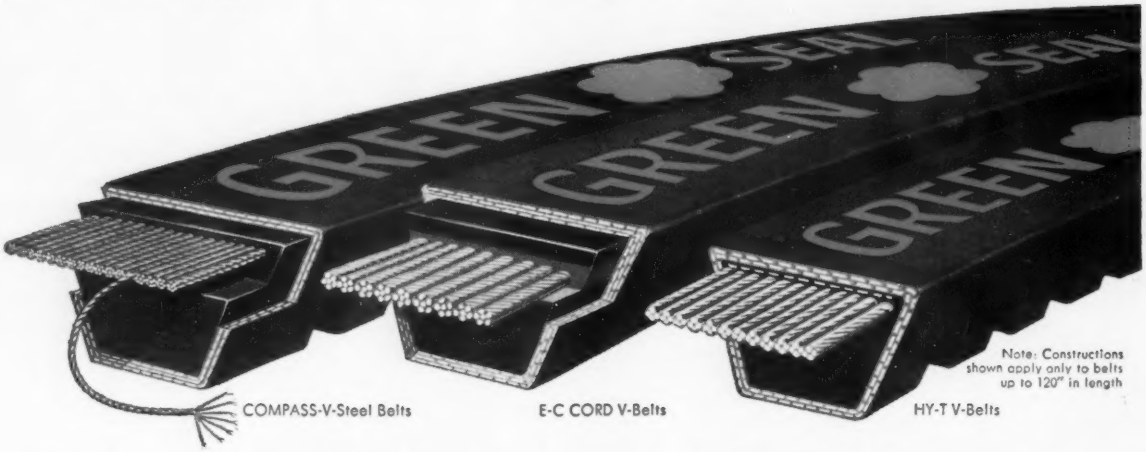
- ☐ *AC Welder/AC Power*
- ☐ *Catalog on new electrodes*

Now—V-Belts with the Green Seal solve the major multiple drive problem



Note: Constructions shown apply only to belts up to 120" in length

The Green Seal stands for true dimensional stability in V-belts. And with Green Seal dimensionally stable belts you can be sure that matched sets are truly matched and will stay matched—that mismatching (the biggest problem in belting multiple drives successfully) is a thing of the past.

The key to dimensional stability lies in the tension members of the belt. For many years, steel cables as developed by Goodyear were the only length stable load carriers, but now they have been joined by synthetic cords, thanks to the amazing Triple-Tempered 3-T process.

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Please send me more information about how V-Belts with the Green Seal solve the major problem in belting multiple V-belt drives.

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Company_____

Street Address_____

City_____ **Zone**_____ **State**_____

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June 24, 1957
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behind the scenes

Warehouse Men Take Time

Carl L. Huff, chairman, Bliss & Laughlin Inc., Harvey, Ill.; and S. A. Seckler, assistant manager of sales, Alloy Steel Division, Republic Steel Corp., Massillon, O., are operating on New Orleans time these days. Late in May, these gentlemen traveled down the Mississippi to accept the second annual producers' award from the American Steel Warehouse Association for the finest advertisements in the interests of the steel distributing industry. Thomas Z. Hayward, vice president-sales, Joseph T. Ryerson & Son Inc., Chicago, made the presentation—which wasn't too difficult because all he had to do was hand over a couple of clocks. The instruments were beating out New Orleans time, Dixieland all the way, so now it's safe to assume that when they mark the hours in Harvey and Massillon, they also tell when it's darkness on the Delta.

Editors Experiment

Agoutis, capybaras and Editors Vance Bell and Robert Jaynes are brothers under the skin, on account of they all belong to the *cavia porcellus* family, sometimes referred to as guinea pigs. While any resemblance between Bell, Jaynes and guinea pigs is simply in the eye of the beholder, an agouti is another matter. Let us hasten to report that Associate Managing Editor Bell and Associate Editor Jaynes are guinea pigs in the interest of the Wire Reinforcement Institute Inc., Washington.

Two years ago, STEEL ran a story on construction materials. Donald M. Gehring, speaking for the institute, gave Bell and Jaynes a lot of information about welded wire reinforcement. Bell wondered if it could be used in an asphalt drive at his home. M. E. Capouch, manager, construction materials sales, American Steel & Wire Division, U.S. Steel Corp., said that if Bell and Jaynes wanted to experiment, AS&W would cooperate.

Bell's driveway was brick. Mr. Capouch delivered flat sheets of wire fabric, which were placed on the brick and covered with asphalt. Some time later, Jaynes, whose driveway was crushed stone, received about 350 lb of coiled wire fabric. This, too, was spread, the asphalt was rolled over it, and now everybody is holding his breath, waiting to see what will happen. Bell wrote a preliminary report, praising the method, and now the Wire Reinforcement Institute Inc., and American Steel & Wire are watching the driveways like hawks. If the experiment is a success, Bell and Jaynes may resign as editors and become agoutis—pardon, we mean driveway contractors.

Newer and Bigger

This week's cover story (page 84) is about current replacement of equipment and construction in the metalworking world. In some ways it is sobering and in other ways it is exhilarating to consider that imposing buildings and sturdy equipment are merely ephemeral things in the path of progress. Obsolescence, deterioration, wear, changing demands, new methods and the frantic pursuit of the future determine replacement and expansion. STEEL figures, elaborating on government statistics, suggest that industry is betting heavily on the future. After you read this report you will be in a better position to know whether you should call or raise.

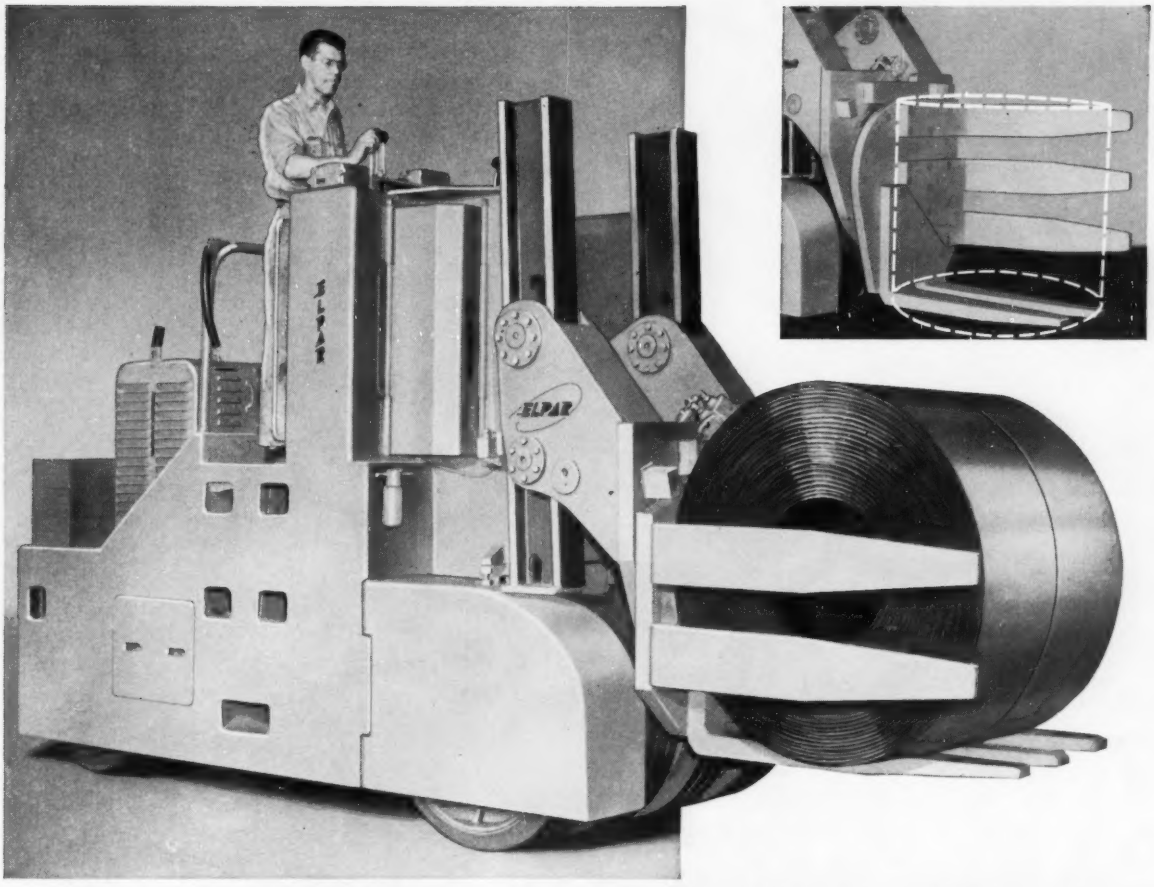
Thish Ish Quite a Load

You have had 18.5 quintillion direct ancestors since A.D. 1. If they were all alive today, and standing upright on sea and land over the entire surface of the earth, each occupying 1.5 sq ft, 7735 earths would be required to hold them. That would be a family gathering to end all family gatherings!

Three bums found a wallet containing $15. They divided the loot equally and decided to blow it in a wine shop featuring pint sales. The limited stock comprised Rhama, three for $1; Rhoma, four for $1; Rhuma, five for $1. Each bum made a different selection, but each spent his entire five bucks and returned with just 20 pints apiece. What were the selections?

Shrdlu

(Metalworking Outlook—Page 67)



New Twist in Coil Handling

Elwell-Parker engineers developed this ELPAR truck with rotating forks to solve a steel mill's coil transfer problems. Coils are stored horizontally and must be upended before they can be conveyed through the annealing furnace. The ELPAR truck does the job with effortless ease, setting the 10-ton coils down in exact position. After annealing, the truck again takes over, picking up and down-ending the treated coils for return to storage. This unit eliminates the need for a stationary upender. And, because of its mobility, the truck finds many other transporting-rotating uses throughout the plant.

Your handling problem may be quite different. Usually the solution will be a standard truck from the vast range of ELPAR models, some of which are illustrated below. Whether the truck is standard or special, you are assured of traditional ELPAR quality—quality that pays off in long years of dependable service with remarkably low operating and maintenance costs.

INVESTIGATE . . . send for GENERAL CATALOG plus HEAVY-DUTY TRUCK BULLETINS.

THE ELWELL-PARKER ELECTRIC CO.
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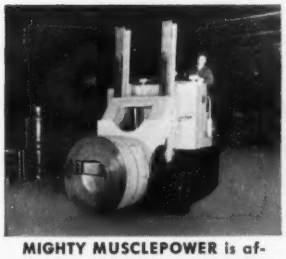
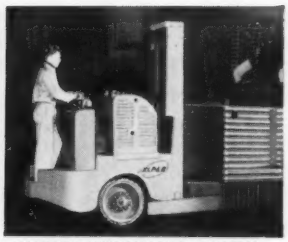


MIGHTY MUSCLEPOWER is afforded by ELPAR heavy-duty ram and fork lift trucks . . . in capacities from 20,000 to 80,000 pounds.

COMPACTNESS AND LARGE CAPACITY are combined in the new R-10 series stand-up, center control trucks. Capacities to 10,000 pounds.

ALL-AROUND VERSATILITY of Air Rights series trucks speeds handling in all phases from receiving through shipping. Capacities: 2,000 to 10,000 pounds.



METAL-WORKING WORKHORSES are ELPAR high lift platform trucks. They offer unmatched advantages in many operations. 4,000 to 100,000 pounds.

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Your local warehouse distributor is indeed the strongest link between the mill and you—an indispensable supply source. And he's never any farther away than your telephone.

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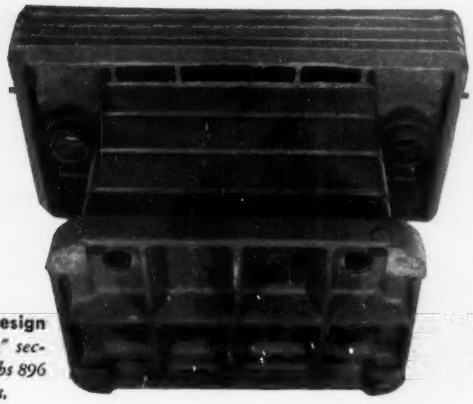

Original design *requires ½" sections, weighs 896 pounds.*

Present welded steel design *uses ¼" sections, weighs only 446 pounds.*

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THIS machine tool base was once a casting, but is now fabricated by welding. The result . . . still higher quality, more rigid machine.

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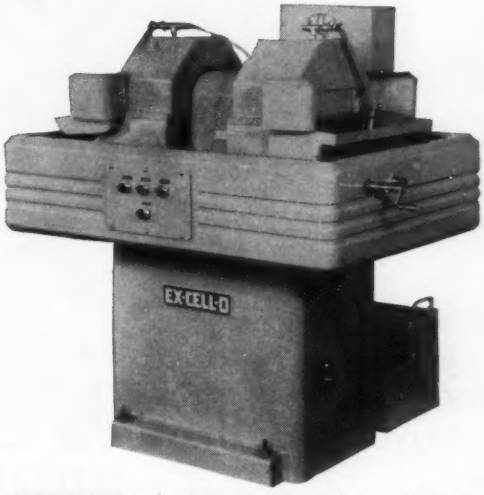
These benefits can be duplicated on many types of machine components similar to your own through proper design for welded steel. A Lincoln specialist will gladly show you how.



Welded steel *tool grinder for sharpening single point tools of carbide, cast alloys and high speed steels. Photo courtesy Ex-Cell-O Corporation, Detroit, Michigan.*

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LETTERS TO THE EDITORS

Steel Industry Capacity List

Please send two copies of the 16-page section, "Steel Industry Capacities" (June 3, page 115). I find it helpful and extremely well done.

Howard H. Wilder
Manager-Engineering Sales
Vanadium Corp. of America
Chicago

I would like three copies. This is the best summary of this important data I have seen. I certainly compliment you on your effort.

Phillip H. Smith
Director of Purchases
LaSalle Steel Co.
Chicago

Interesting, Useful Report

We found the article, "Reveals Test Procedures . . . for Atomic Products" (June 10, page 194), interesting and useful. Could you send us two copies?

J. D. Hagans
Sales Manager-Castings
Ohio Steel Foundry Co.
Lima, O.

Detour for Labor Drive

Please send a copy of the article, "Labor: Which Way Now?" (June 10, page 99). I enjoyed it a lot.

Richard N. Jackson
440 Champaign St.
Lincoln Park, Mich.

Brazing Report Found Useful

We would appreciate a copy of the article, "Brazing Stainless Steel Honeycombs" (Apr. 8, page 92). It will be useful in our business.

Herman B. Director
Herman B. Director Associates
Washington

Engineer Shortage Brainstormed

I have read with vivid interest your article, "Brainstorming in Action . . . Stretching Engineer Talent" (May 13, page 70). I should like a copy.

Dr. A. T. Yu
Chief Design Engineer
Robins Engineers Division
Hewitt-Robins Inc.
New York

Query on Chemical Milling

I congratulate you on the interesting and well written article, "Contouring with Chemicals" (June 3, page 85).

I am interested in chemical milling application, limitations, who has the rights to the process and other information useful in studying this method. I would also like to see this method in

(Please turn to page 12)

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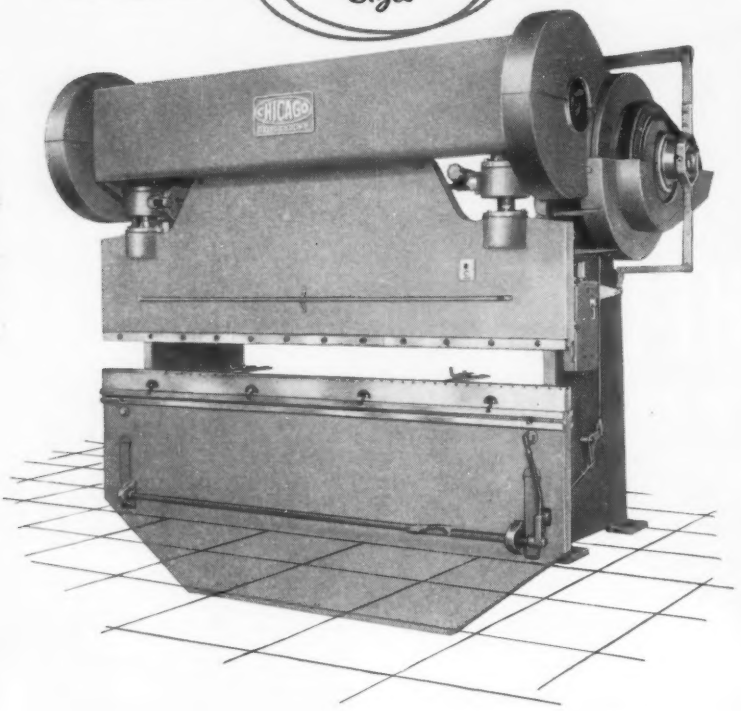

This is one of the Series D CHICAGO press brakes. It has a bending capacity of 10 feet by ¼ inch—150 tons. Over-all bending length is 12′-2″.

Complete recommendations for any job on request.

K777

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LETTERS

(Concluded from page 10)

operation. Is there a plant in the Buffalo area doing chemical milling?

Frank J. Angelis
Assistant to Director of Mfg.
American Machine & Foundry Co.
Buffalo

• *For information on the process, we suggest you contact the Chem-Mill Division of Turco Products Inc., 6135 S. Central Ave., Los Angeles, Calif.*

We believe that the North American Aviation Co. plant in Columbus, O., is doing chemical milling. We know of no plants in the Buffalo area.

Spreading Management Interest

Recently I sent for and received several copies of your 1957 Program for Management articles, "Care and Feeding of the Junior Executive" (Feb. 11, page 93) and "Grooming Middle Managers" (Mar. 18, page 93).

I found them helpful and distributed them in the organization. I would like 12 more copies so more people can enjoy and benefit from them.

I. J. Steinhoff
Model Production Superintendent
Farnsworth Electronics Co.
Division of International Telephone & Telegraph Corp.
Ft. Wayne, Ind.

Congratulations on Presentation

I have read with interest the article, "Ways To Cut Waste" (Apr. 29, page 208). You are to be congratulated on a constructive and stimulating presentation. Would it be possible for you to send six copies?

I would also appreciate permission to reprint part of the article.

Franklin P. Huddle
Conservation Specialist
Research & Engineering
Office of the Assistant Secretary of Defense
Washington

• *Permission granted.*

Guarding Against Creep

Please send two copies of your excellent article, "Creep and High Temperature Alloys" (May 27, page 108).

L. A. Huber Jr.
Production Engineer
Kearfott Mfg. Corp.
Newark, N. J.

Engineers To See Article

We enjoyed the article, "White-Collar Drive Falters" (May 20, page 95). We would like to make a wider circulation of it in our section. Please send six copies.

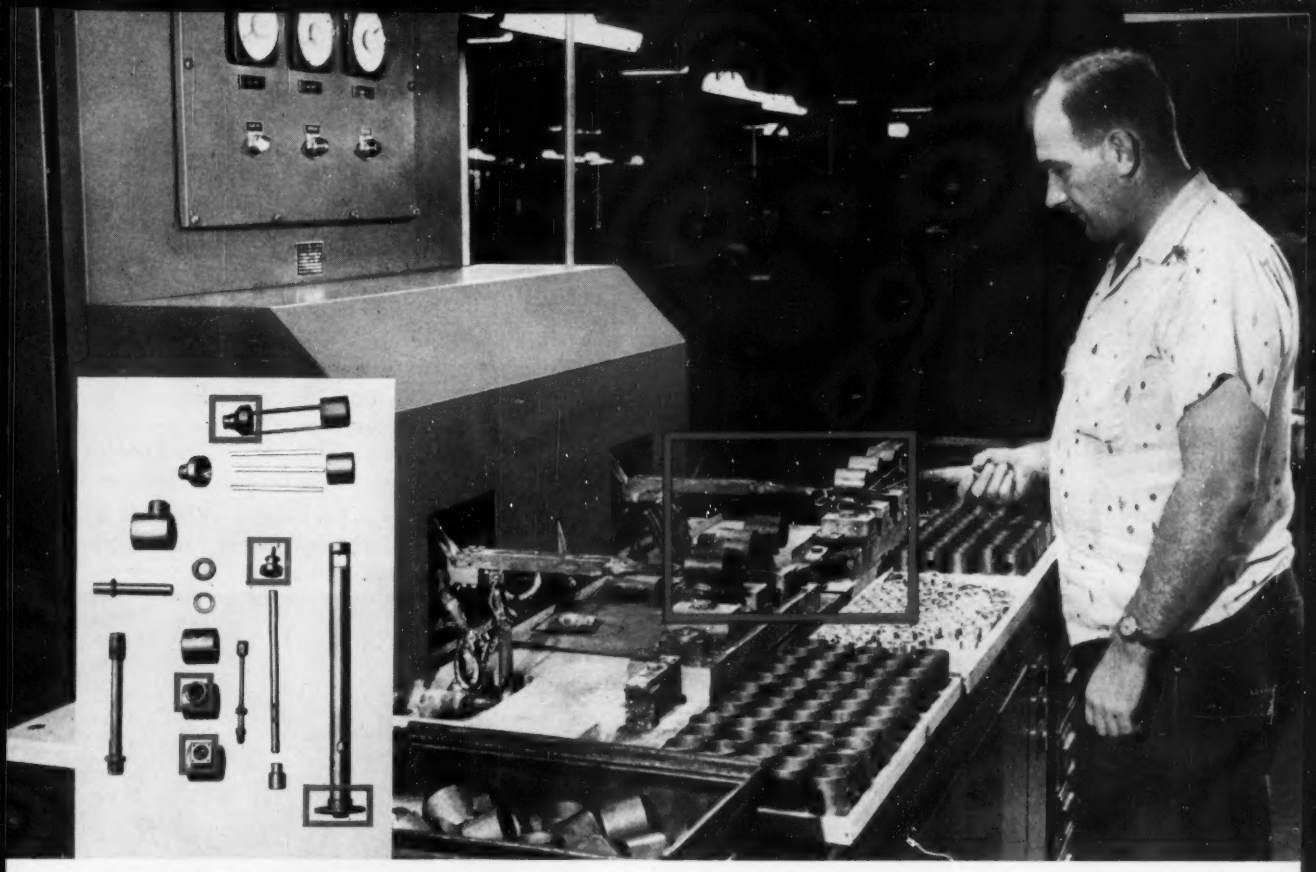
R. J. Botz
Engineering Administration
Communication Products Department
Industrial Electronics Division
General Electric Co.
Syracuse, N. Y.

New Portable Inspection Tool

The article, "Hardness Tool Checks Specs" (June 3, page 90), refers to the Henrikson Hardness Monitor. We would be interested in knowing the name and address of its producer.

Charles A. Davis
Materials Engineering Department
Deere & Co.
Moline, Ill.

• *It is produced by the inventor, Karl Henrikson, 2016 Linn Blvd. S.E., Cedar Rapids, Iowa.*



AT HARTFORD MACHINE SCREW CO.—

General Electric induction heaters braze 20 different parts, help cut rejects 91%

At Hartford Machine Screw Co., a General Electric electronic induction heater is used for brazing a wide variety of parts for electric-switch housings and jet engines.

The General Electric unit takes on jobs ranging from ¼-inch to 1½-inch tubing. After brazing, each part undergoes a regular 500-pound pressure test, and the aircraft work must pass radiographic inspection. With the General Electric induction heater, rejects have been reduced 91 per cent, from 30-35 per cent to a maximum of two per cent.

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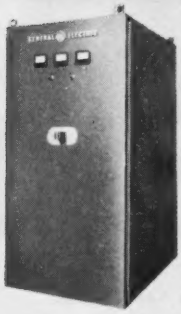
For more information, send in the coupon below or contact your nearby General Electric Apparatus Sales Office



Four models in each of four ratings; 7½ Kw, 15 Kw, 25 Kw, and 40 Kw.

General Electric Co.
Section 722-6
Schenectady, N. Y.

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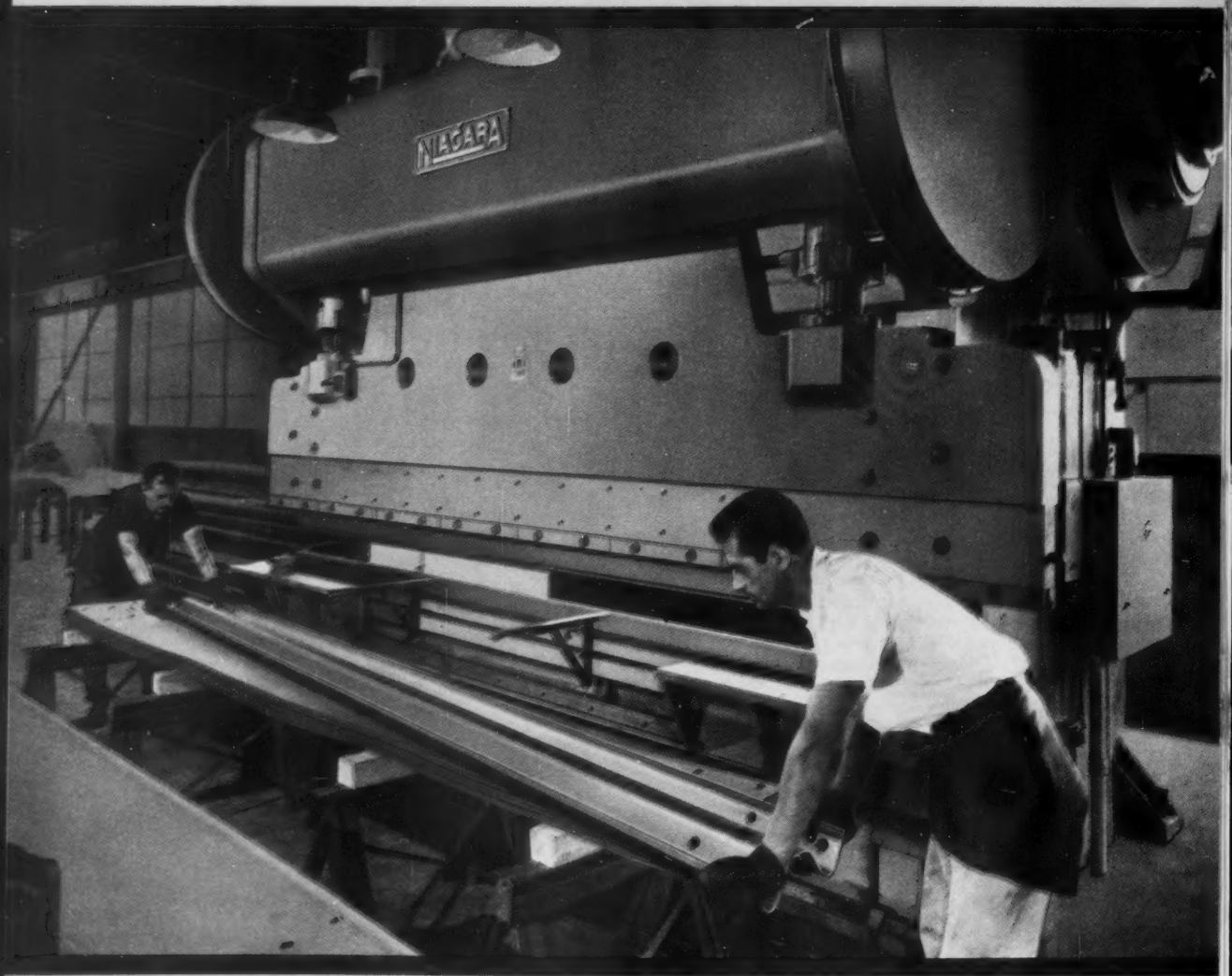

(Above) Forming highway guard rails from 12 gage steel on Niagara 520 Ton Press Brake.

(Right) Piercing rails with same machine.

(Far Right) Forming chair seat frames for office furniture from 20 gage steel on Niagara 150 Ton Press Brake.

Niagara for Press Brakes"

"The personnel of our organization has been acquainted with Niagara equipment for years. Niagara will stand behind *any* equipment furnished. Many millions of operations in the past 5 years on their presses and press brakes... equipment satisfactory from both the operational and safety standpoint. Our intention is to use the Niagara line entirely."

There in the words of one customer (a large Ohio metal fabricator whose press brake operations are illustrated), you have the sentiments of hundreds. Once experienced with *any* of the other metalworking machines which Niagara makes... presses, shears, bending rolls and dozens more... one just naturally thinks first of Niagara whenever the subject of press brakes comes up.

REASONS ARE MANIFOLD: (1) Extreme helpfulness of Niagara's engineers in selecting the machine and accessories that will do the job best (no other manufacturer can offer so complete and large a line of sheet and plate metalworking equipment). (2) Unrivaled reputation and experience in the field, dating back 77 years, that assure unquestioned reliability. (3) World-wide recognition for design leadership, combining rock-bottom operating economy and top-notch performance in *every* product it makes (take a moment to run down this partial list of imposing press brake features):

- *Double end twin drive with double reduction gearing for smooth, uniform application of power at both ends of ram.*
- *Rugged, all-steel frames with box type crowns of unequaled strength and rigidity.*
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- *Gearing totally enclosed in sealed oil baths for thorough, clean lubrication.*
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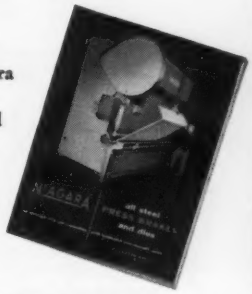
- *Powerful, smooth-acting, multiple disc clutch and brake.*
- *Gibs maintain accurate, endwise alignment of ram.*



Standardized in a complete line, ranging from 50 through 775-ton capacities, Niagara Press Brakes are built to produce a tremendous variety of work uniformly and accurately. Post yourself now on all the details by requesting Bulletin 89 D and, as soon as you can, avail yourself of some really worthwhile suggestions from a Niagara representative. Write.

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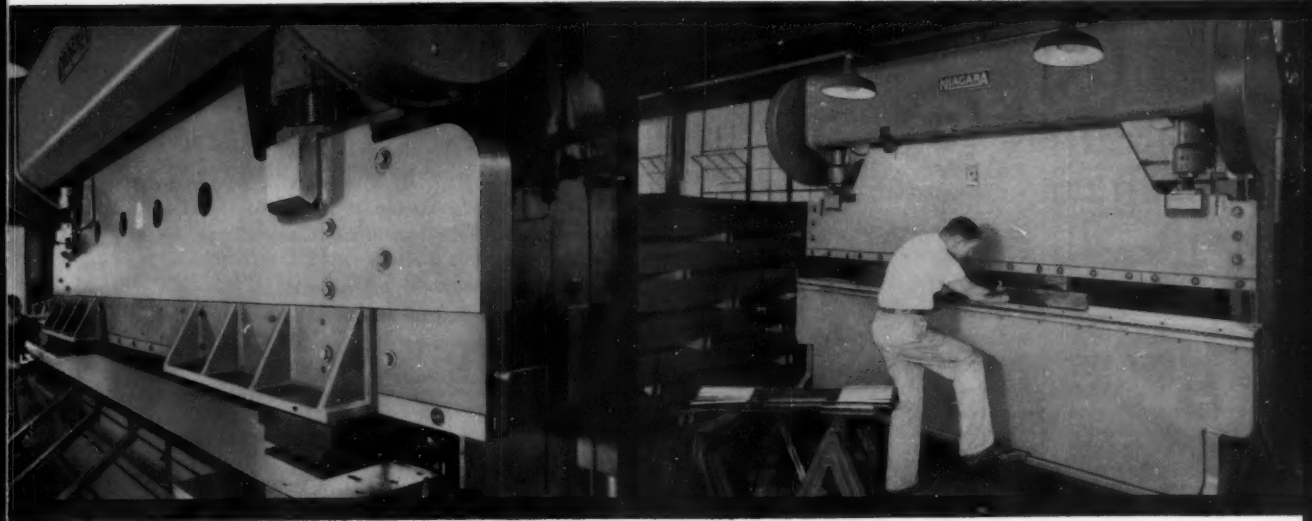

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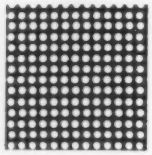

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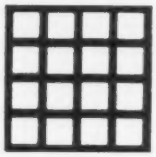

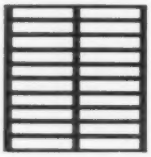

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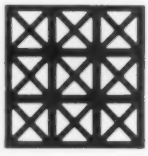

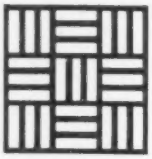

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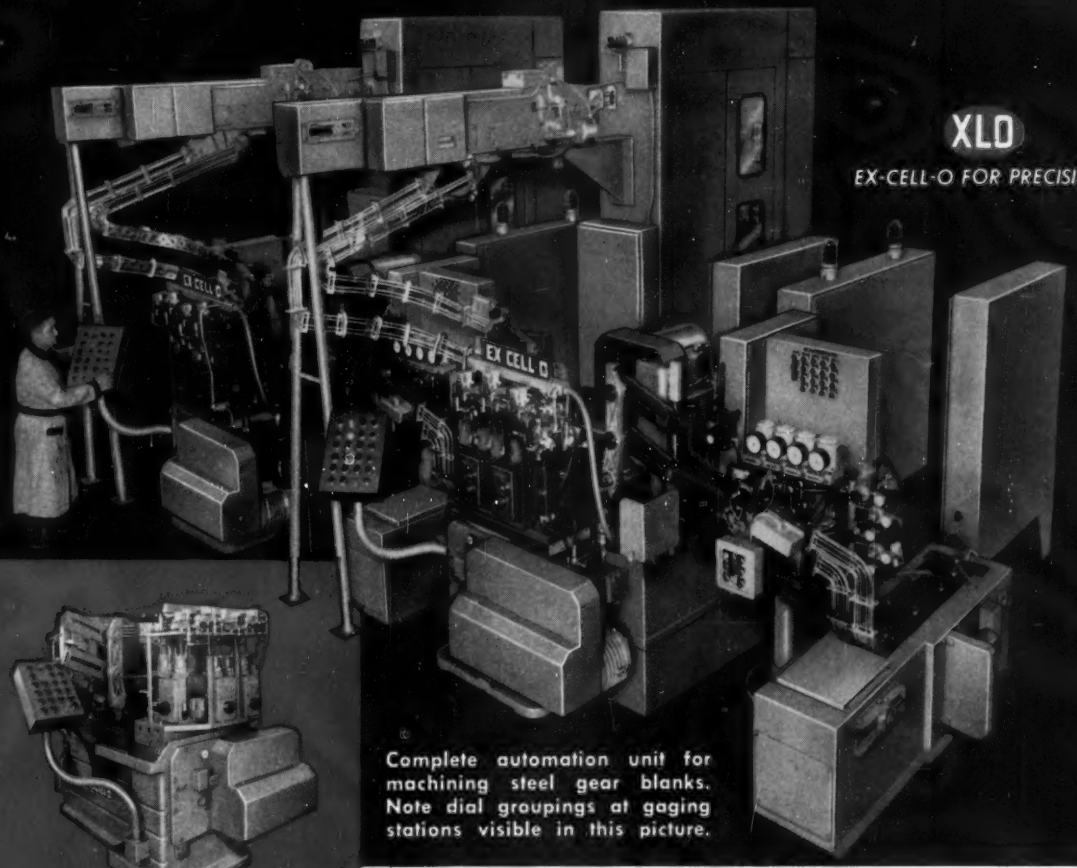
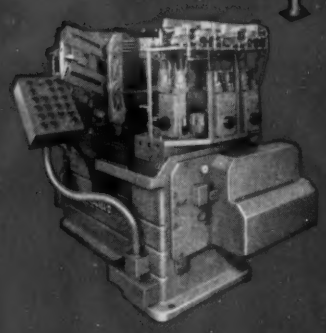
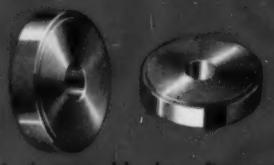


Complete automation unit for machining steel gear blanks. Note dial groupings at gaging stations visible in this picture.



Ex-Cell-O Style 312 Cam Boring Machine adapted for automation. Components on cross slide automatically adjust tools to hold specified limits.



Typical gear blanks after automatic machining is completed.

Standard Ex-Cell-O Machines Handle Automatic Operations

Take these cam boring machines, for example: they are standard Ex-Cell-O 312s. When a customer's production schedule called for an unusually high per hour output of steel gear blanks Ex-Cell-O engineers incorporated these machines into an automated setup.

Included in the new setup: two cam-operated Ex-Cell-O Precision Boring Machines, two Gear-O-Mation storage-distribution units, three gaging stations.

The boring machines finish all the surfaces of the gear blanks: face both sides, chamfer both inner and outer edges, bore the central holes and turn the outside diameters. Tools are adjusted automatically to maintain required tolerances. Gage units automatically check parts prior to entering the machining stations, and the storage-distribution units provide space for a bank of parts at each machine station.

If you're interested in automation, but are held back by the high cost of specially designed machine tools, call your nearby Ex-Cell-O Representative today. Perhaps a standard Ex-Cell-O machine tool setup can be adapted to your automatic operation requirements. Or, if you prefer, contact Ex-Cell-O in Detroit directly.

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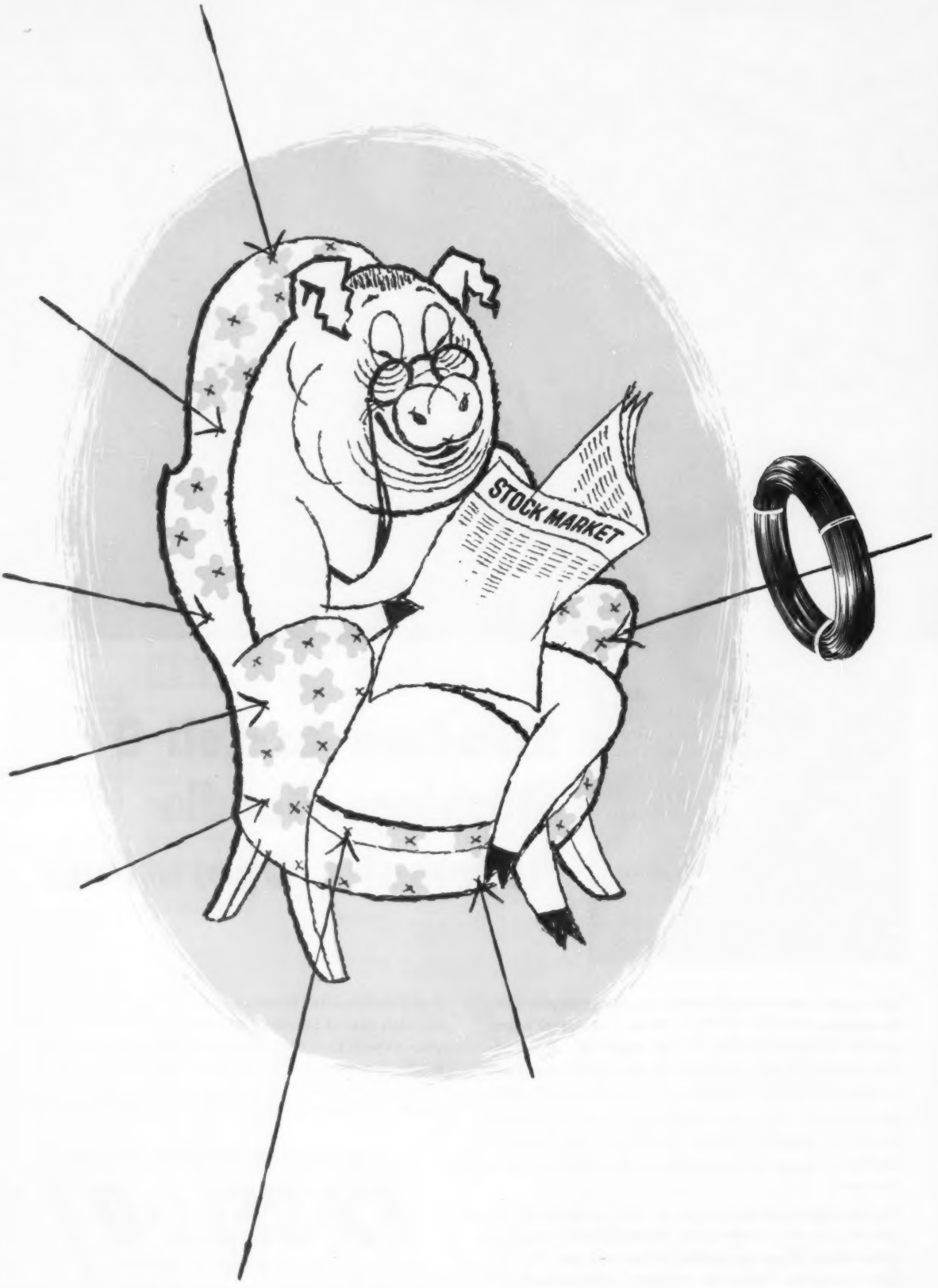
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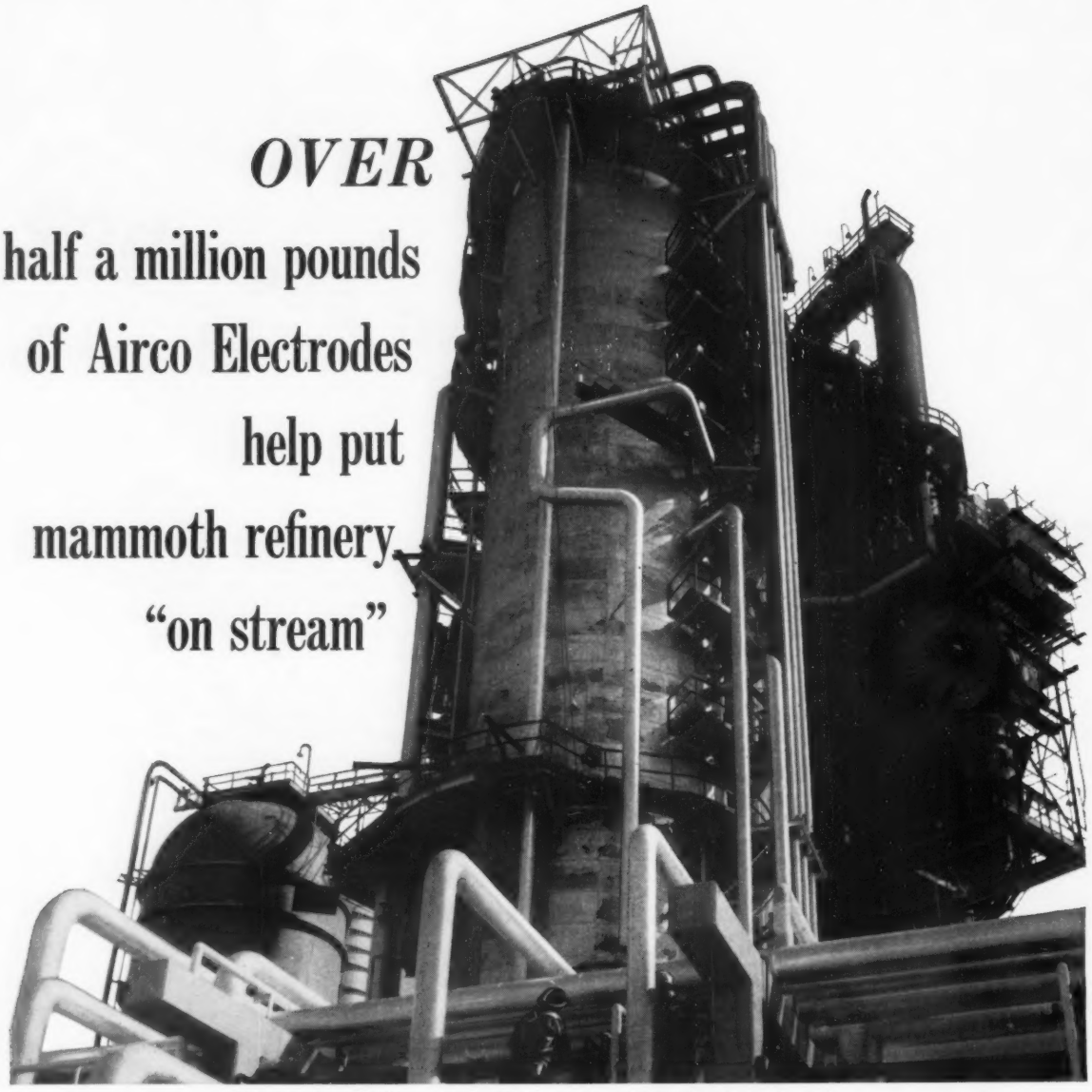

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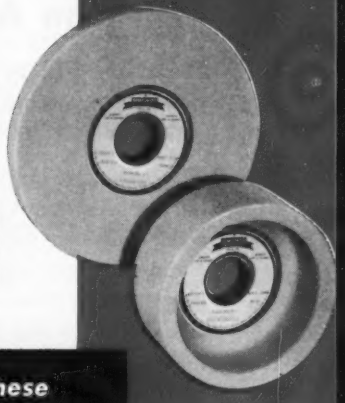

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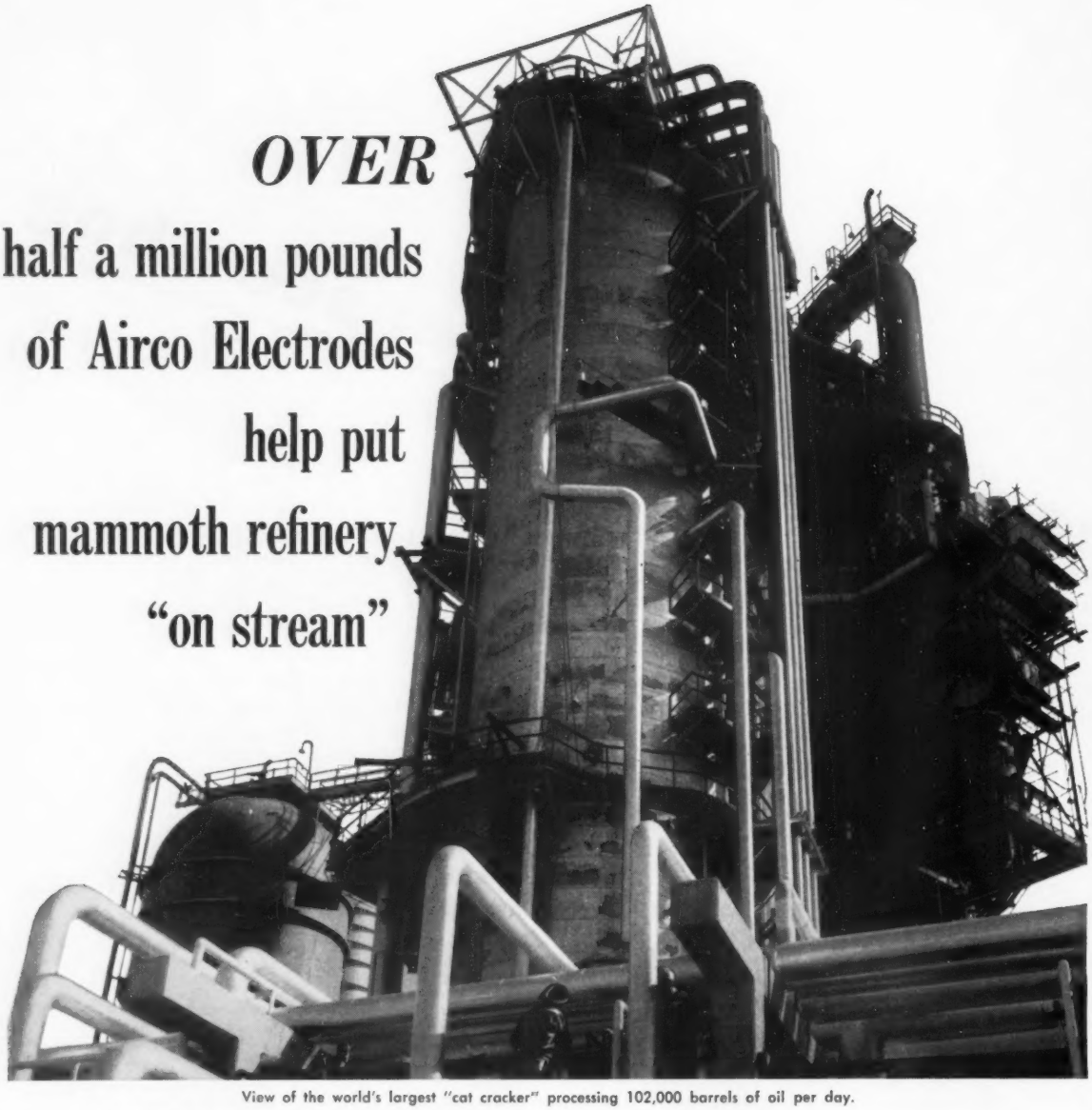

View of the world's largest "cat cracker" processing 102,000 barrels of oil per day.

The Tidewater Delaware Refinery is the largest plant of its kind ever built at one time. An indication of its size is that each barrel of crude oil or partly processed liquid travels through nearly 250 miles of installed piping by the time it reaches the gigantic product storage tanks.

Welding played a vital role in almost every phase of construction, and the products and services of Airco were used extensively to meet the volume requirements. Over half a million pounds of Airco electrodes of every type were employed on the job.

In building a refinery—or, repairing any small part—Airco's Electrode Pocket Guide can help you select the best electrode for the job. Its 48 illustrated pages provide complete information, graphs and charts, applications and procedures, for using the complete line of Airco Electrodes.

Naturally, it is free. Write for your copy—request Catalog 1318.

welding
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Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide — gaseous, liquid, solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetate, alcohols, and other synthetic resins.

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IL BOND ... for longer, faster, heavy-duty grinding

New IL Bond . . . it's in the grinding wheel mix. Special chemicals and compounds added to conventional resinoid bonds provide an *internal lubricant* to increase cutting action and prolong grinding wheel life. For ALL your snagging jobs!

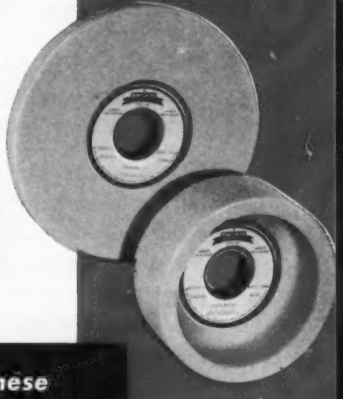
NEW

DA Borolon® TRADE MARK ... abrasive for resinoid bonded snagging wheels

New DA Borolon . . . an improved, smaller crystal aluminum oxide abrasive for resinoid snagging wheels for floor stand and swing frame grinders . . . has more and sharper cutting edges, gives more production. Use with IL Bond described above.

NEW

SA Borolon® TRADE MARK ... abrasive for toolroom grinding wheels



New SA Borolon . . . a radically different, friable aluminum oxide abrasive with a unique *single* crystal formation that gives cooler, faster grinding and longer life. Ideal for tool and cutter grinding and horizontal surface grinding.

Send for descriptive catalog bulletins on these new products. Ask for IL, DA or SA bulletins.

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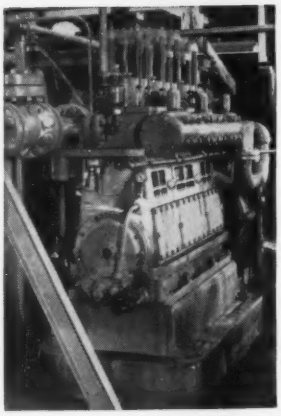
For your tough pumping problems, it pays to specify Aldrich. Write today for a copy of Data Sheet 100, a condensed catalog and selection chart covering our entire line. The Aldrich Pump Company, 18 Pine Street, Allentown, Pa.



Four 5" stroke Aldrich Direct Flow Pumps on die casting service in a midwestern metalworking plant. These pumps are handling 250 gpm at 1500 psi.

THE ALDRICH PUMP COMPANY

CALENDAR
OF MEETINGS

June 24-28, American Institute of Electrical Engineers: Summer general meeting, Sheraton-Mt. Royal hotel, Montreal, Que. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

June 24-29, Concrete Reinforcing Steel Institute: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Institute's address: 38 S. Dearborn St., Chicago 3, Ill. Managing director: H. C. Deizell.

June 27-28, Refractories Institute: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Institute's address: 1801 First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: Avery C. Newton.

July 6-9, Automotive Engine Rebuilders Association: Summer meeting, Royal York hotel, Toronto, Ont. Association's address: 419 N. Capitol Ave., Indianapolis 4, Ind. Executive vice president: R. G. Patterson.

July 16-17, Truck-Trailer Manufacturers Association: Summer meeting, Homestead, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Secretary: John B. Hulse.

July 24-27, National Tool & Die Manufacturers Association: Summer meeting, Grove Park Inn, Asheville, N. C. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Aug. 12-15, Society of Automotive Engineers: West coast meeting, Olympic hotel, Seattle. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 20-23, Western Electronic Show & Convention: Cow Palace, San Francisco. Information: WESCON, 342 N. LaBrea, Los Angeles 36, Calif.

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N. J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

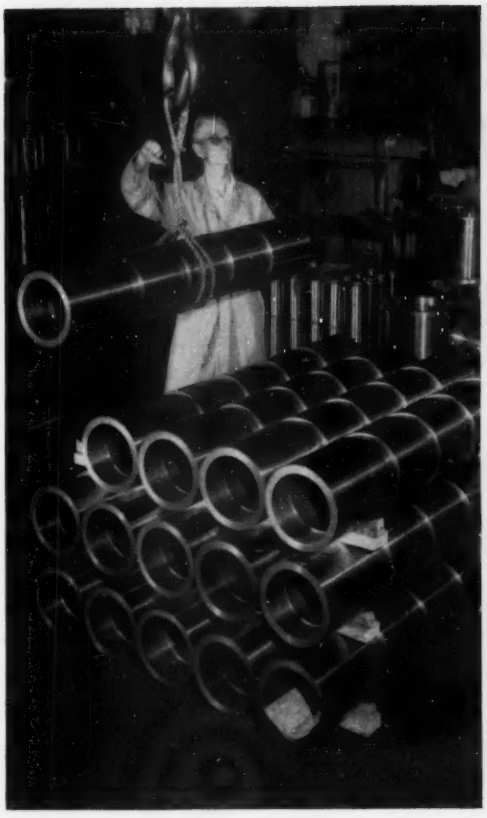
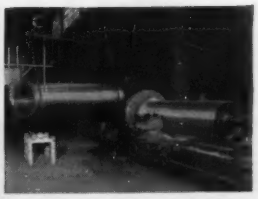
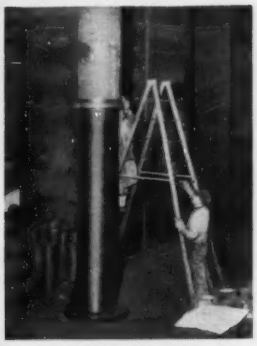
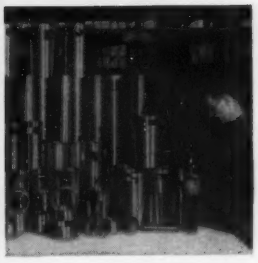
Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

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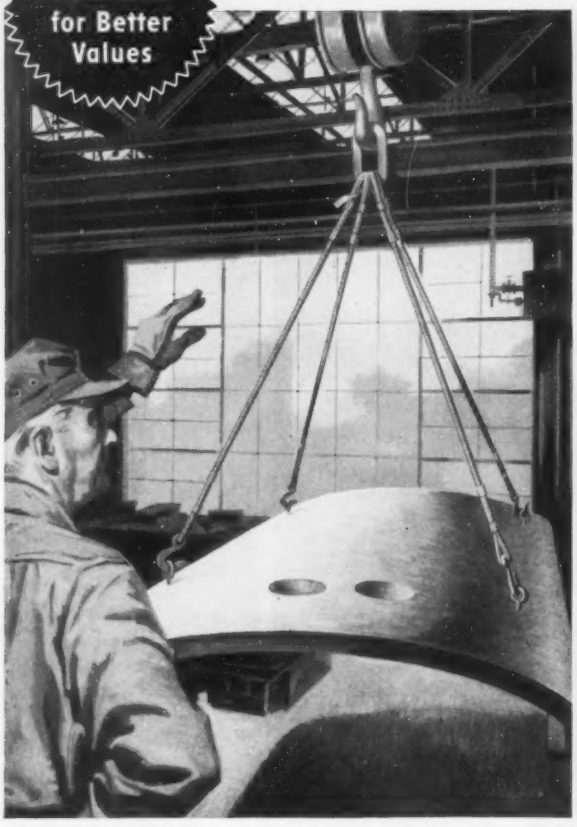

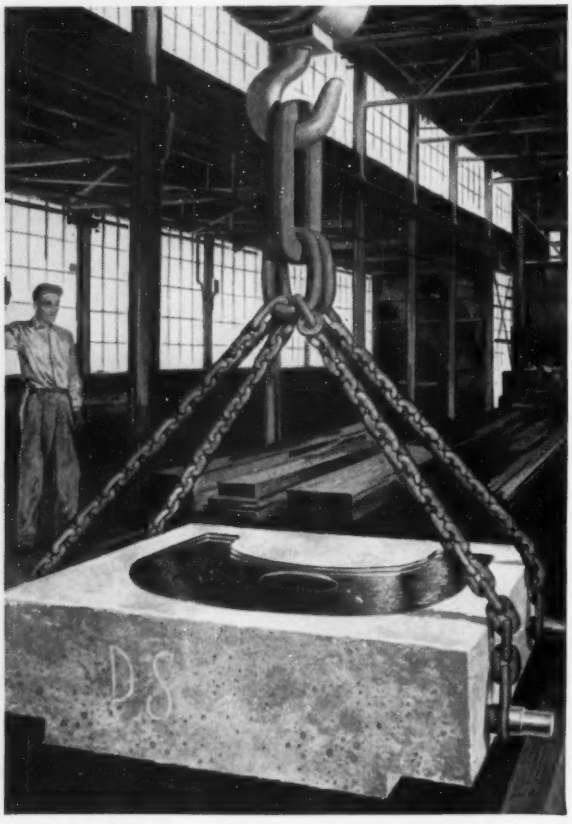

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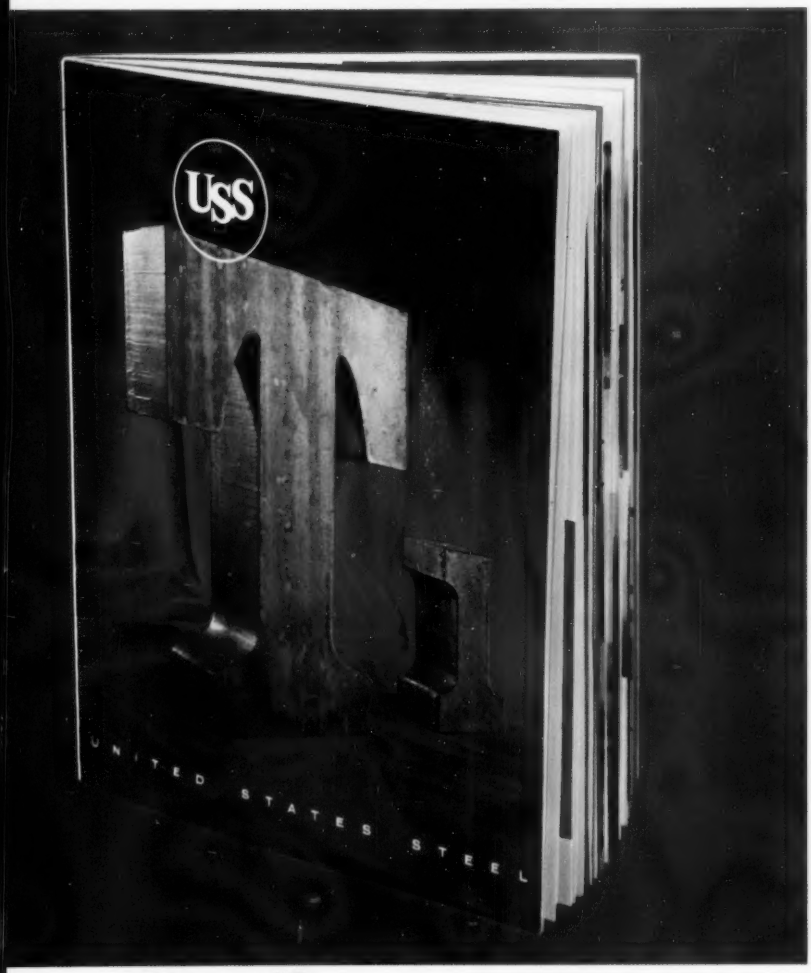

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"It's a hydrogen-annealed with a 30-micro-inch finish,"

mass spectrometer magnet...

says **Albert J. Gross,** *U. S. Steel Machinist, Homestead Forgings Division*

We must admit that there was some doubt that these sections in the picture could ever be made to the specifications required by Argonne National Laboratory. They are yoke members and pole pieces for a 100-inch double-focus, mass spectrometer.

One of the primary requirements of the magnet was that it be made from as pure a steel as was commercially obtainable. Also, it had to be produced in one heat to minimize variation in behavior of the magnet.

The heat-treating problems were enormous and would have stumped any organization without the facilities and background of USSteel. The annealing, which was performed in a hydrogen atmosphere, developed a uniform, large grain structure for optimum magnetic characteristics. Unusual techniques were used, and a special steel jig was constructed so that the large pieces could be annealed without warpage.

Machining problems are best described by Al Gross who has worked as a USS Machinist for 34 years, 20 of them in the Forgings Division. In his words, "The specs for machining tolerances, surface finish and flatness were so exacting that at first there was doubt that it could be done. The wide plates, which are actually in three pieces, have a 50-micro-inch finish. The narrow pole pieces had to be parallel and flat within plus or minus .001". The ends had to be within .002" of a true square, and the surfaces were polished to a 30-micro-inch finish."

We don't receive orders for spectrometer parts very often. But even so, this job shows that a wide range of facilities are available when you specify a USS Quality Forging. From the melt shop, through the forging, heat-treating, machining and inspection departments, you can be sure of equipment of the best type, operated by men of the highest skill.

Please direct your inquiries for forgings to our nearest District Office and your request for our free 32-page booklet on forgings to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS QUALITY FORGINGS

heavy machinery parts . . carbon, alloy, stainless
forged steel rolls and back-up roll sleeves
electrical and water wheel shafts
specialty forgings of all types

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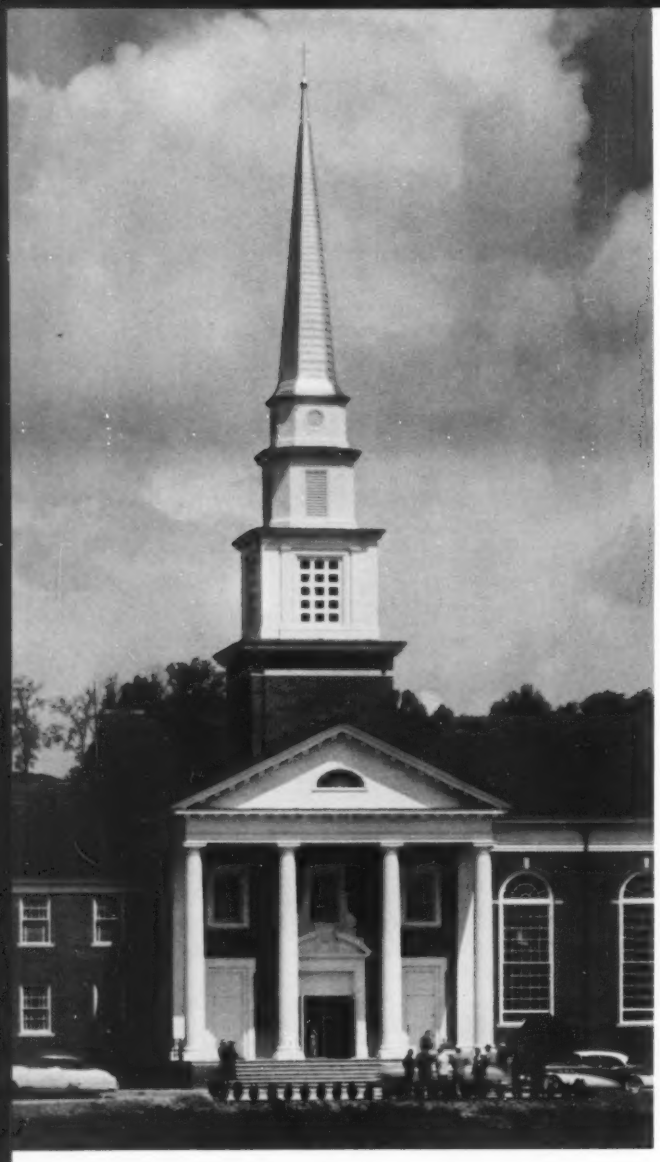
UNITED STATES STEEL



NOTHING *can equal*
Stainless Steel
in its unique combination of properties

No other design material can match Stainless Steel in its combination of desirable properties: corrosion resistance, strength, hardness, beauty, cleanability and easy fabrication. If you're looking for a reliable source of supply, remember that United States Steel offers you the widest range of types, finishes and sizes.

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USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS
PIPE • TUBES • WIRE • SPECIAL SECTIONS

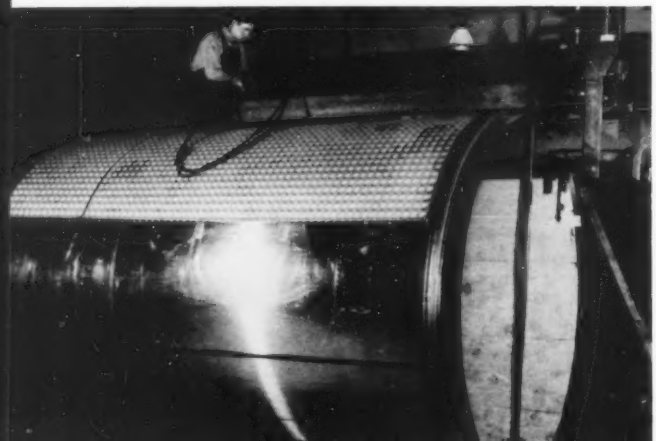
USS

UNITED STATES STEEL

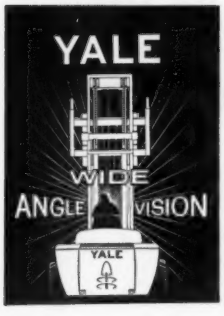
FOR BEAUTY. Stainless Steel shingles in diminishing sizes create a beautiful, gleaming steeple for the State Street Methodist Church in Bristol, Virginia. Architect Allen Dryden, of Kingsport, Tenn., specifies Stainless Steel for jobs like this to assure lasting beauty, protection from weather and freedom from maintenance. This spire is sheathed in Type 302 26-gage Stainless Steel, and the cross is built of Type 302 Stainless bars. Construction details were engineered by Overly Manufacturing Company, Greensburg, Pa., who also fabricated and erected the steeple.

FOR FLEXIBILITY OF DESIGN. In this "Cold-Zone" cooling-storage milk products tank, made by Damrow Brothers Company, Fond du Lac, Wisc., Type 304 10-gage Stainless Steel was used for the smooth, easy-to-clean inner wall. Again Stainless Steel—this time Type 304 16-gage—was used for the dimpled outer wall which is stave-welded to the inner shell. This unusual design of dimple size and arrangement gives proper baffling and velocity to the refrigerant as it passes through the cooling area. Stainless Steel provides greater sanitation, durability, long life, strength and—the flexibility necessary to make this design possible.

FOR DURABILITY. The Master Combination Padlock, designed for school locker room use and built by Master Lock Company, Milwaukee, Wisconsin, features a double-case construction—with Type 430 Stainless Steel used for the outer case. This Stainless Steel design makes it one of the strongest padlocks available. In addition to increasing the lock's durability, Stainless Steel also adds to its sales appeal and to its resistance to the corrosive atmospheres of damp locker rooms. The springs, too, are made from USS Stainless Steel—Type 304 Ameroxide coated wire.



New Yale High-Capacity Gas Trucks with 300% MORE VISIBILITY



Only new Yale 15,000-20,000 lb. capacity Gas Trucks offer you "Wide-Angle Vision"—Yale's exclusive feature that gives the driver 300% more visibility for greater safety. Design advances such as nesting of upright channels; wide spacing of lifting channels and hoisting cylinders; high, center location of driver's seat assure not just unobstructed center visibility but also a greater arc of vision. New Yale Gas Trucks also feature a low center of gravity, a broader lifting base, wide channel-roller spacing and large high-flotation tires for maximum stability even under capacity-load conditions. Lifting speed of 60 feet per minute, fast controlled lowering, travel speed up to 20 MPH assure fast cycle operations.

Features Important in Handling FABRICATED METALS:

• I-beam side members in frame for extra strength • Channels mounted on ball-bearing rollers to reduce friction and wear • Ball-mounted, self-aligning hoisting cylinders • Your choice of Fluid Coupling or standard transmission.

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YALE*

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Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers
Warehousers • Hand Trucks • Hand and Electric Hoists

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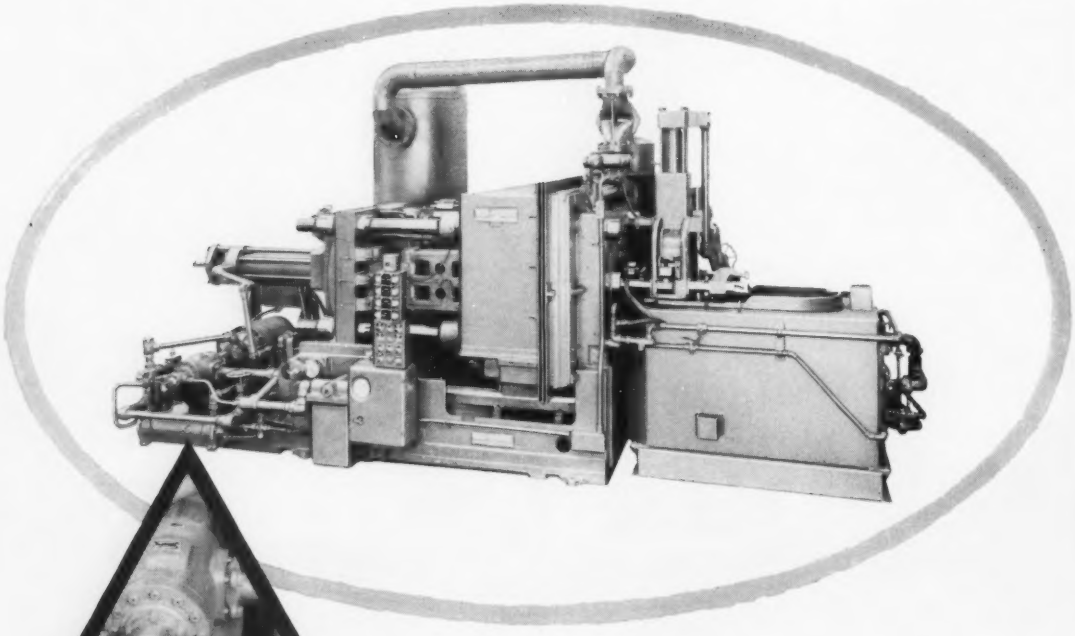
"PROVEN DEPENDABILITY"



Reed-Prentice's big reason for standardizing on

ROSS EXCHANGERS

Featuring the *Vacucast Process,* "a new system that delivers improved zinc alloy die castings under vacuum," this Reed-Prentice Die Caster is designed to give full locking tonnage on every shot.

Neatly mounted close to the heart of the hydraulic system is a compact Ross Type BCF Exchanger. It insures full rated locking pressure by providing dependable oil cooling at all times. Oil viscosity won't break down to cause pump slippage and power variations when this die caster *puts on the squeeze.*

Says Reed-Prentice Corporation: "We continue to standardize on Ross Heat Exchangers because of their proven dependability in many years of service. Most die casting machines are kept in production 24 hours a day. Therefore, it is essential for us to use reliable components on our machines."

Reed-Prentice is only one of numerous manufacturers who regularly furnish Ross Exchangers on their hydraulic equipment to assure safe, dependable oil cooling. In addition to being top-rated for thermal efficiency, they're ruggedly built to withstand punishing hydraulic shock.

Pre-engineered and fully standardized, Ross Exchangers are assembled from mass produced parts in a broad range of sizes to meet your needs. For detailed information request Bulletin 1.1K5. Ross Heat Exchanger Division of American-Standard, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Limited, Toronto 5, Ont.

ROSS HEAT EXCHANGER

Division of AMERICAN-Standard

HIGH PURITY MAKES THE DIFFERENCE

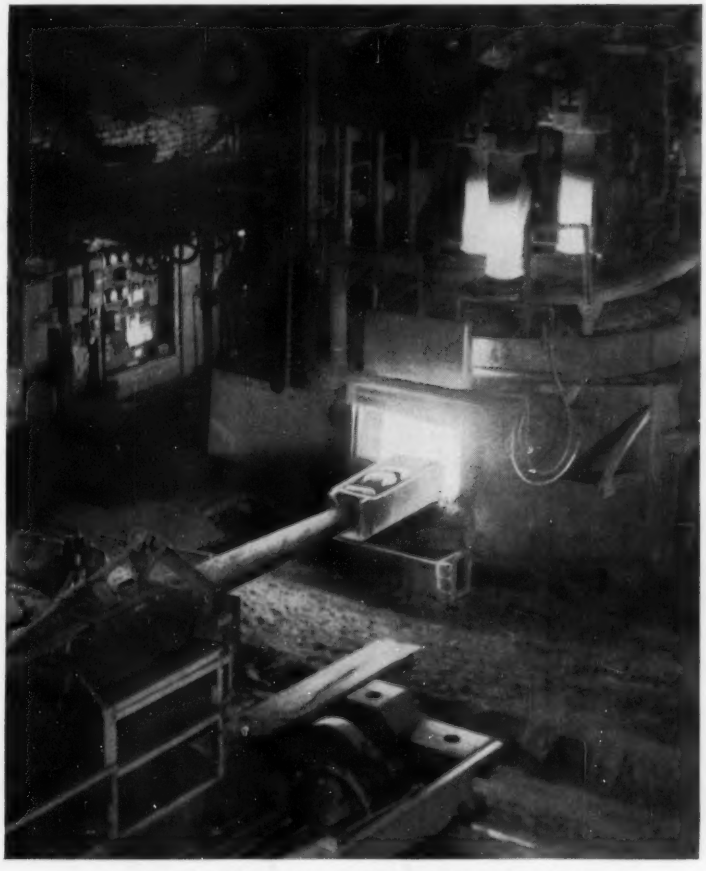
Electrolytic Manganese Improves Melting Practice

Stainless steel makers have found electrolytic manganese to be a great aid in simplifying melting operations, minimizing impurities, and facilitating closer control of composition, particularly for producing the new 200 series with higher manganese content.

Electrolytic manganese can also be used advantageously for the production of non-ferrous alloys, including high-temperature and electrical resistance alloys of aluminum, copper, and zinc. It is free of elements which adversely affect the properties of non-ferrous alloys.

ELECTROMET electrolytic manganese is ideal for all applications requiring manganese metal of very high purity and low iron content. It has a minimum purity of 99.9 per cent on a metallic basis and is the thickest plate commercially available. For stainless steels requiring nitrogen for austenite stabilization at hot-working temperatures, ELECTROMET also offers a nitrogen-bearing grade of electrolytic manganese.

This illustrated folder on electrolytic manganese and technical assistance in the use of ELECTROMET alloys and metals are available on request. Write or phone the nearest ELECTROMET office: Birmingham; Chicago; Cleveland; Detroit; Houston; Los Angeles; Phillipsburg, N. J.; Pittsburgh; San Francisco. In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Toronto. ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.



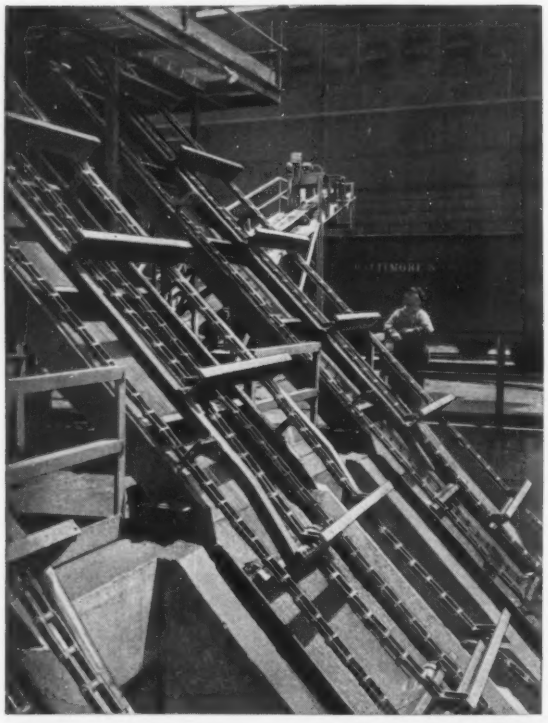
Cans containing 50 lbs. of ELECTROMET electrolytic manganese are a convenient means of charging high-purity manganese in the production of stainless steel.

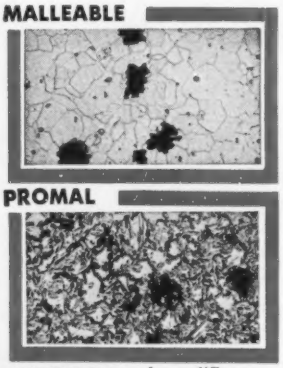
Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Specify longer-lasting Link-Belt Promal chains for extra durability





MICROPHOTOS show difference between ordinary malleable iron and Promal. Upper—white areas in malleable microphoto represent "free-iron" . . . black shows soft nodules of carbon. Lower—the dark areas in the Promal structure show stronger, stiffer reinforcing material which strengthens metal and resists distortion and wear.

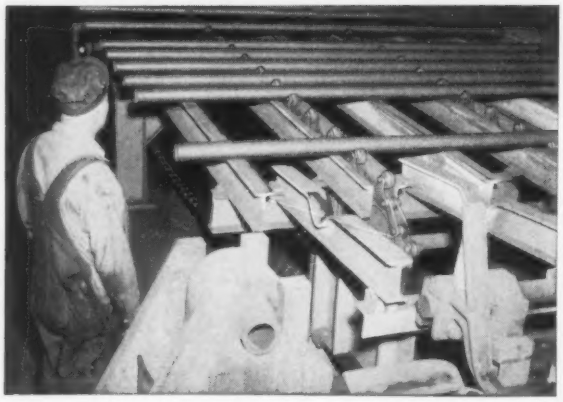
◀ **UP TO 475 TONS** per week of steel mill scale are recovered by this Link-Belt system. Promal chain on Straightline Collector moves scale from settling tanks to discharge conveyor. Promal is especially suitable for long heavy-duty conveyors and elevators.

Specially heat-treated malleable iron provides extra wear resistance

Fewer conveyor shutdowns and minimized replacements are economies realized by users of Link-Belt Promal chain. Its greater strength absorbs continuous impact loads — and wear resistance supplies the durability to cope with severe abrasion.

Promal is more than a partially annealed or surface-hardened malleable iron. Developed by Link-Belt, this specially heat-treated malleable iron is actually transformed into a metal of radically different physical properties. Promal, because of uniform micro-structure throughout its whole section, provides greater ultimate strength, higher yield point, exceptional fatigue resistance and a remarkable capacity to withstand abrasion.

For unusually abrasive or mild corrosive conditions, Promal chain can be furnished with "file-hard" surfaces. Copper bearing or special alloy content also available.



Promal chain controls uniform cooling of pipe

An inclined conveyor, using Link-Belt Class 1100 Promal chain with attachments, permits an Ohio steel mill to control cooling of longer tubes than previously possible. Pipe is received from hot finishing operations at temperatures up to 1800 F. Controlled chain speed permits uniform cooling of outer tube periphery.

Where and how to apply Promal in the metal working industry

Choose Link-Belt Promal chains for highly abrasive conditions—for extra strength and wear resistance demanded by heavy loads or long, sliding conveyors. They last much longer . . . cost but a little more.

The wide range of Link-Belt chains available in Promal includes all types of cast and combination chains.

HEAT-RESISTANT PROMAL is recommended for temperatures up to 1000 F. This SMGL-618 Promal chain conveyor with riser attachments picks up and conveys sheet steel through furnace. Chain has operated continuously for two years without failure.

HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

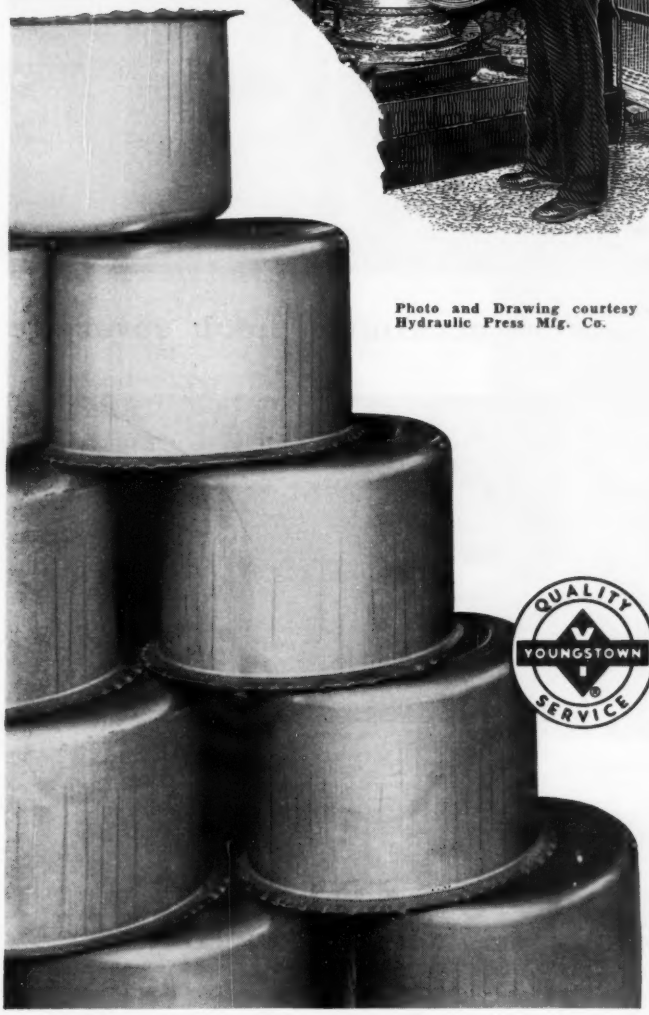
CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,281

YOUNGSTOWN SHEETS AND STRIP

Speed-Up Toughest Deep-Drawing Operations

Photo and Drawing courtesy of Hydraulic Press Mfg. Co.



Modern high-speed precision drawing and stamping operations require only the highest quality steel if top production - low reject rates are to be maintained on difficult-to-run parts. And the highest quality steel produced anywhere is Youngstown Sheets and Strip.

Our satisfied customers, across the nation, tell us time and time again: "Our production is increasing—Rejects falling off—Fabrication costs are down." Why not make Youngstown your regular sheet and strip specification from now on—for improving both product quality and the overall profit picture.

When you use Youngstown Sheets and Strip you can be sure metallurgical quality will never vary because they are produced by steelmakers—with over 56 years experience—using only the most scientific quality control techniques. This guarantees a proper blending of the required ductility, tensile strength, flatness and surface to meet **your** exact specifications.

Why not call or write your nearest Youngstown District Office, today, for metallurgical assistance or additional information—or write directly to our Home Office.

QUALITY YOUNGSTOWN SERVICE

COLD ROLLED SHEETS AND STRIP

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices - Youngstown 1, Ohio

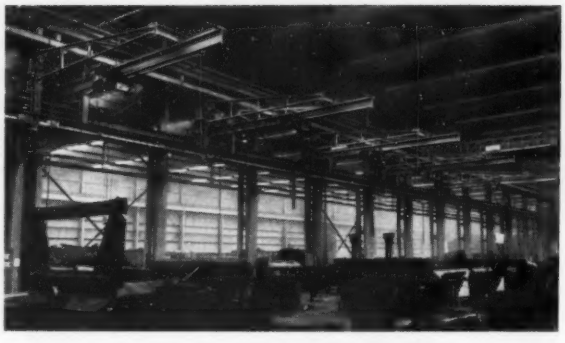
District Sales Offices in Principal Cities

14 Industrial Cranes
chosen by largest railroad car shop

wall traveling jib crane features maximum hook coverage

This mammoth railroad car shop installed 14 *Industrial* wall traveling jib cranes to obtain maximum flexibility of operation without obstruction of floor space or interference of overhead cranes. Operating singly or in multiples these *Industrial* cranes easily move along the long runway with assembly line load and in effect give infinite number of jib crane installations depending on requirements.

Consult with Industrial Crane & Hoist for practical answers to your materials handling problems.



3-ton capacity with 30 ft. span Wall Traveling Jib Cranes with Hi-carbon steel boom. Cranes operate on six double flange 12" forged steel wheels rolling on two horizontal and one vertical runway.

Industrial CRANES

INGERSOLL B-W BORG-WARNER

INDUSTRIAL CRANE & HOIST

INGERSOLL PRODUCTS DIV. BORG-WARNER CORP.

1550 S. PAULINA STREET, CHICAGO 8, ILLINOIS

Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois

IF THE TRUTH MUST BE TOLD

. . . *by a spring*

This spring, the dependable heart of a leading make of air pressure gauge, must "tell the truth" years on end. But at first there were tough problems . . . and eventually the manufacturer turned to the Worcester Wire Works Division of National-Standard for a *special spring wire* that would solve them . . .

Look how the spring has a double pitch to properly take and indicate a wide range of pressure loads. Obviously, extreme accuracy, exceptional uniformity, and exact behavior are absolute musts. Rejects were running up to 50 per cent!

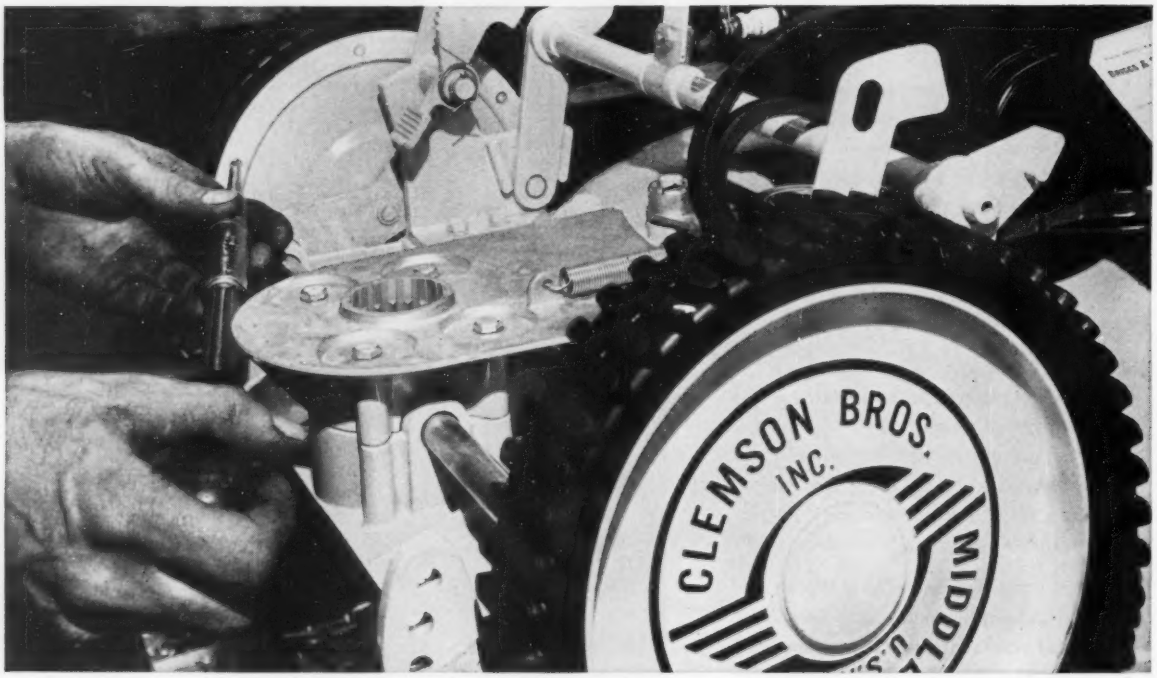
That is, until Worcester Wire Works studied the requirements, did developmental work, came up with a specially prepared spring wire and so solved the problems!

Like the other National-Standard divisions, Worcester Wire Works features unusual service that helps other manufacturers turn out better products at lower cost. Try us. You'll see.

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.; *music spring, stainless and plated wires, high and low carbon specialties* • WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • ATHENIA STEEL, Clifton, N. J.; *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.; *industrial wire cloth*

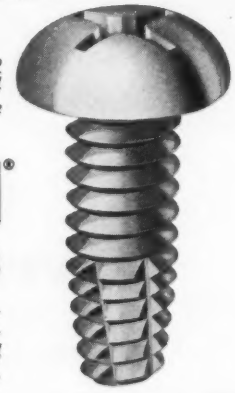
PARKER-KALON SELF-TAPPING SCREWS "MOW DOWN" ASSEMBLY PROBLEM FOR CLEMSON LAWN MOWERS



"Our problem," says Mr. Charles Kellogg, chief engineer, Clemson Lawn Mower Div., "was fastening an 8" plastic ring into a wheel rim to hold a protective cover. We needed a screw which would cut threads into a tough plastic—a fastening which would hold securely against vibration set up by the power unit. In addition, we had to consider an awkward drive angle and the danger of marring the finish.

"The fasteners we were using couldn't measure up. So we replaced them with P-K Type F screws. They're working fine."

This is another example of how Parker-Kalon fits the screw to the job. Whatever the nature of your fastening problem, it will pay you to ask your nearby Industrial Distributor for complete information and P-K fastener samples.

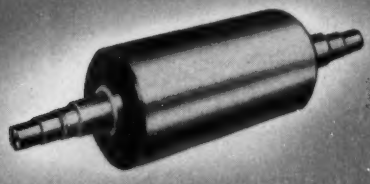


PARKER-KALON® fasteners

PARKER-KALON DIVISION, *General American Transportation Corporation. Self-tapping Screws, Socket Screws, Screw-nails, Masonry Nails, Wing Nuts and Thumb Screws. Sold everywhere through leading Industrial Supply Distributors. Factory: Clifton, New Jersey—Warehouse: Chicago and Los Angeles.*

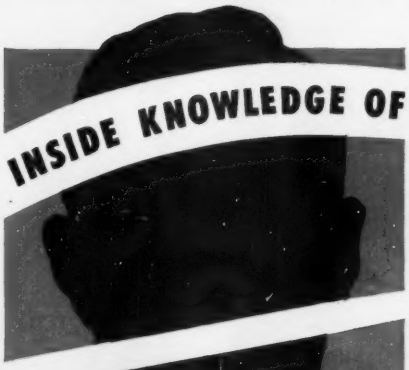
"Y.F.&M." builds the best of them!

INSIDE KNOWLEDGE OF STRIP MILL PROBLEMS

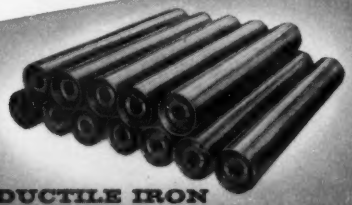


PARALLOY

HOT STRIP COILER ROLLS • COILER PINCH ROLLS
PICKLING LINE PINCH ROLLS • UPCOILER ROLLS
CLEANING LINE PINCH ROLLS • SINKER ROLLS
CARRIER ROLLS • TEMPER MILL TENSION ROLLS



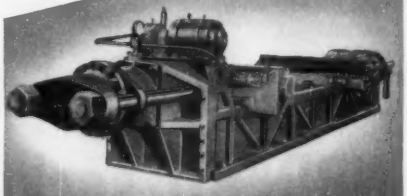
PLUS more than **70 YEARS EXPERIENCE** building what you need



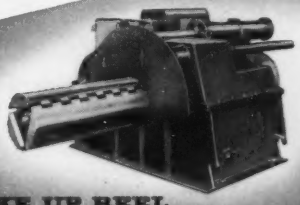
DUCTILE IRON

RUNOUT TABLE ROLLS
HOLDING TABLE ROLLS
LOOPER TABLE ROLLS
LOOPER TABLES
APRON PLATES

Ductile Iron Castings up to 50,000 lbs.

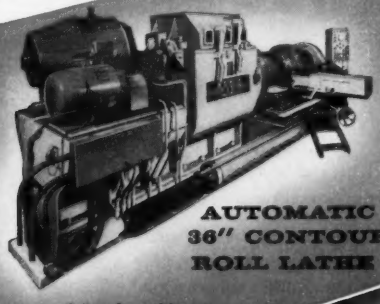


90" X 240" X 1/4"
STRETCHER LEVELER



TAKE UP REEL

Complete Slitting Lines and Equipment



AUTOMATIC 36" CONTOUR ROLL LATHE

Other Capacities:
24"—48"—60"

YOUNGSTOWN

HOT and COLD STRIP MILL MAINTENANCE SPECIALISTS

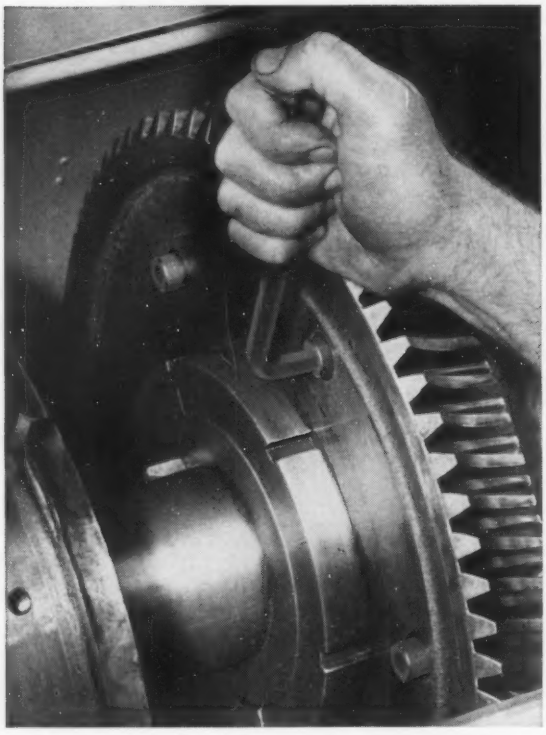
"YOUNGSTOWN" service is based on thorough understanding of strip mill problems and experience in solving them. For example, the problems of scratching, galling, pickup and excess wear are solved by the use of **PARALLOY ROLLS.** Their uniform hardness all through means you can roll more tonnage from new to scrap diameter. **"YF&M" DUCTILE IRON ROLLS** are the proven answers in overcoming heat check, warpage and cracking . . . especially good under the sprays. **"YOUNGSTOWN" MACHINERY** serves major steel mills from coast to coast.

Consult us about your problems.
Let us quote on your requirements.

The Youngstown Foundry & Machine Company

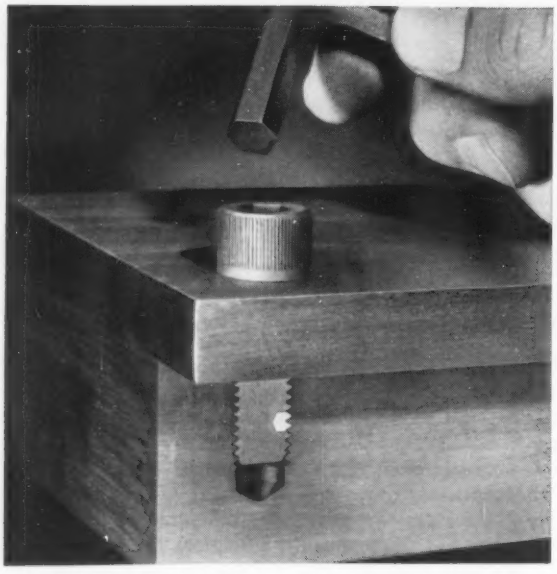
SERVING INDUSTRY SINCE 1885

Youngstown 1, Ohio



The ordinary fasteners securing the worm wheel to the drum shaft in this automatic screw machine loosened, causing $120 worth of damage to parts. Labor for the repair job cost $100. The ordinary fasteners were replaced with self-locking UNBRAKOS, and there has been no trouble since.

Vibration won't loosen self-locking UNBRAKO socket cap screws



HOW IT LOCKS. The tough, resilient Nylok locking pellet keys itself into the mating threads. It forces threads together and locks the screw securely—whether or not the screw is seated.

UNBRAKO socket screws with the Nylok* self-locking device eliminate fastener problems caused by vibration.

Take the drive system in the automatic screw machine illustrated above, for example. The screws originally used to secure the worm wheel to the drum shaft loosened, causing considerable damage, besides loss of production time. These have now been replaced with self-locking UNBRAKO socket head cap screws and the trouble has been eliminated.

An UNBRAKO socket screw with the Nylok self-locking device is a single unit. Just screw it into any tapped hole. Seated or not, it locks positively wherever wrenching stops. Constant vibration or endless running of a machine won't affect these self-locking UNBRAKOS. The screws will not work loose!

Write today for your copy of Form 2193, which gives catalog and technical data on the complete line of UNBRAKO socket screws with the Nylok self-locking device. Or see your local industrial distributor. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION

STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA

*T.M. Reg. U.S. Pat. Off., The Nylok Corporation

Loaded aluminum cars were crashed together again and again at Aluminium Limited's laboratories in Kingston, Ontario. Even a million pounds of impact failed to damage these rugged cars.

New aluminum hopper cars withstand million-pound punch ...increase payloads up to 16%

WITH ITS GREAT SUCCESS in new passenger trains, it was natural to think of aluminum for freight cars. Aluminum cars would mean heavier payloads . . . trains 16% longer hauled by the same locomotive. Lightweight cars would also reduce track wear and switching costs. And, of course, aluminum's corrosion resistance would provide substantial maintenance savings.

Tests Prove Strength

But would aluminum cars be rugged enough for this service? The answer—a definitive *yes*—was uncovered by Aluminium Limited's research facilities. In recent tests aluminum hopper cars withstood up to a million pounds of impact . . . far more than is ever encountered in a lifetime of service.

Growing Fabricator Markets

With all these advantages, aluminum is sure to play an important role in modernization and replacement programs for America's fleets of 2,000,000 freight cars. With this and other structural applications, aluminum fabricators are sure to find ever-increasing markets.

Through research and engineering, Aluminium Limited is continually working to develop new uses and markets for aluminum. To match the growing demand, production capacity in Canada is expanding to reach a level of 1,000,000 tons annually by 1960.

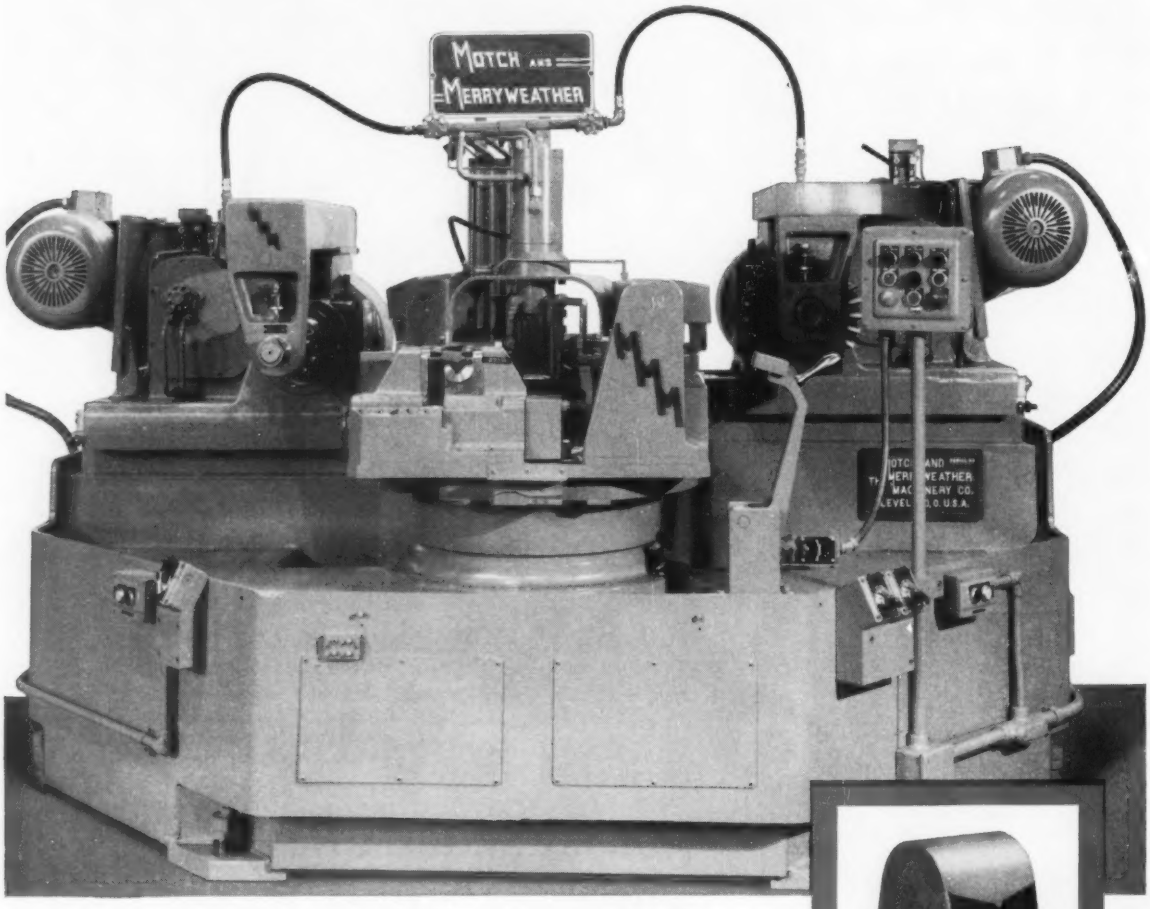
Supplying U. S. industries with primary aluminum from Canada

Aluminium Limited *Sales, Inc.*

630 FIFTH AVENUE · NEW YORK 20, N. Y.

CLEVELAND · CHICAGO · DETROIT · LOS ANGELES · BUENOS AIRES · SÃO PAULO

Another specialized machine by M & M



Special duplex milling machine

for milling and slotting chain links

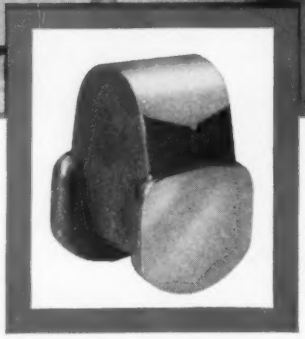
Operation—Straddle and form mill on right hand station, slot or straddle mill on left hand station.

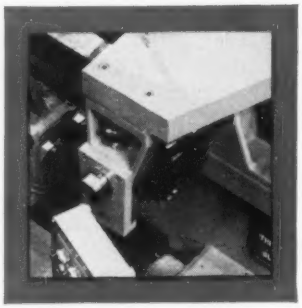
Universal—Six different sized parts run over this machine.

Cycle—Either automatic or manual cycle. Cycle time, 64 seconds.

Feed—Custom-designed and built hydraulic head feed, index and clamp.

Fixtures—Four fixtures are mounted on index table.





Heavy welded steel construction, annealed milling head and rugged, all-helical gear train in heads assure continuous production with a minimum of maintenance and costly downtime.

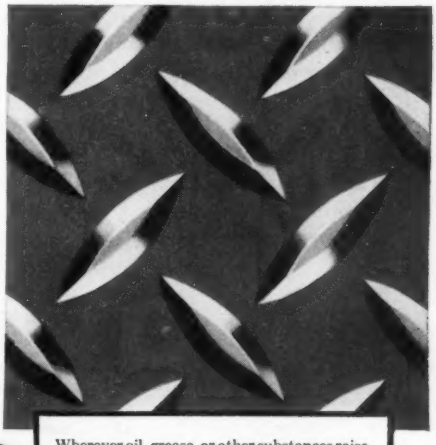
the
MOTCH & MERRYWEATHER MACHINERY
Company
MACHINE TOOL MFG. DIVISION
CLEVELAND, OHIO

LOW COST DIFFERENCE BETWEEN

SLIPPING FEAR

SAFETY

Pattern actual size



Eliminate slipping fear and increase efficiency by installing A.W. Super-Diamond—the low cost safety floor plate that takes the danger out of hazardous slipping areas.

Stops skids and slips *with*	Raised steel figures *diamond-shaped for maximum slip-skid resistance from all approach angles*
Get maximum wear *with*	Tough rolled steel floor plate
Easily fabricated *with*	Ordinary shop equipment
No matching problems *with*	Non-directional pattern—minimum waste
Cleans, drains rapidly *with*	No maintenance problems
Solve your slipping problem *with*	A.W. Super-Diamond as independent flooring, as an overlay—or used structurally.

For complete information write on company letterhead to Dept. SDS12. *No other floor plate can match A.W. Super-Diamond's safety and durability at so low a cost.*

A.W. SUPER-DIAMOND

ROLLED STEEL FLOOR PLATE

ALAN WOOD STEEL COMPANY • CONSHOHOCKEN, PA.

Wherever oil, grease, or other substances raise special slipping accident hazards, we suggest a check on the special non-slip qualities of A.W. ALGRIP—the world's only abrasive rolled steel safety floor plate.

Other Products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate—Plates—Hot and Cold Rolled Sheet and Strip—(Alloy and Special Grades)

A big step forward in barrel finishing

Improved ALUNDUM TUMBLEX* "A" abrasive brings you many new "Touch of Gold" advantages*

The new Norton TUMBLEX "A" abrasive has exceptionally long life . . . great resistance to wedging in work-piece crevices . . . adds attractive lustre . . . and can handle the widest variety of parts.

It performs several operations at once — removing flash, scale, tool marks and burrs, while forming radii and finishes to the required microinch.

It is also better sized, more uniform in shape and available in a wider range of sizes.

SIZES NOW AVAILABLE

No.	Size	No.	Size
00	1½" to 2"	3½	1/16" to 1/8"
0	1" to 1½"	4	1/32" to 1/16"
1	3/8" to 1 1/8"	5	1/16" to 1/4"
1½	1 1/16" to 3/4"	6	1/8" to 3/16"
2	5/16" to 3/4"	8	1/32" to 1/8"
2½	1/2" to 5/16"	10	standard 10 mesh
3	3/8" to 1/2"	12	standard 12 mesh

Every one of these sizes has the advantages that will increase the value of your finished parts and cut the costs of your general barrel finishing. That's how improved TUMBLEX *"A" abrasive will step up your profit-boosting "Touch of Gold" to a new high.*

Send Your Work Samples

to our enlarged Sample Processing Department — and include a finished piece. We will barrel finish the samples with new TUMBLEX "A" abrasive — or any other Norton tumbling abrasive that may be more suitable — and return full information telling you exactly how you can improve product quality and cut finishing time and costs. NORTON COMPANY, *General Offices,* Worcester 6, Mass. Plants and distributors around the world.

G-310

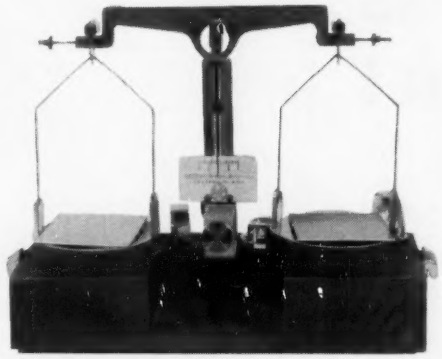
NORTON
ABRASIVES

Making better products...to make your products better

NORTON PRODUCTS:
Abrasives • Grinding Wheels • Grinding Machines • Refractories

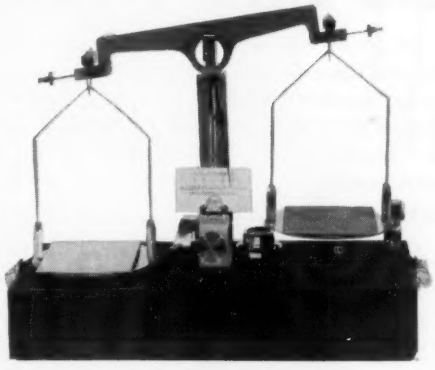
BEHR-MANNING DIVISION:
Coated Abrasives • Sharpening Stones • Behr-cat Tapes

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries



NO WEIGHT DIFFERENCE. Two identical panels of low-carbon sheet steel were used. They balanced the scale.

RODINE MINIMIZES ACID ATTACK. Each panel was placed in a beaker containing 10% by volume of 66° Bé sulfuric acid at 160°F. The acid in the right-hand beaker was uninhibited. The acid in the left-hand beaker was inhibited with Rodine 82, ¼% by volume of the concentrated acid. There was little or no hydrogen evolution in this beaker . . . Rodine retarded the attack of the acid on the base metal.



RODINE SAVES METAL. Both panels were removed from the acid pickle solutions after 5 minutes. The one pickled in the uninhibited acid had lost 1.4% of its original weight. The one pickled in the Rodine-inhibited acid had lost only 0.001%. This represents a saving of 26 lb. of steel for each ton pickled; and a simultaneous saving of nearly 50 lb. of 66° Bé sulfuric acid when Rodine is used to inhibit the acid.

ACP Rodine®

SAVES ACID, SAVES METAL— GIVES YOU MORE STEEL TO SELL

With ACP Rodine as the pickling acid inhibitor, you use less acid and have more steel to sell. Up to 50 lb. of acid is saved per ton of steel pickled and up to 26 lb. of steel. Fuming is practically eliminated. Formation of blisters and embrittlement is minimized. Costs of charging and cleaning of pickle baths are reduced—baths can be operated longer, and less acid is required to keep them at desired concentration. There are fewer rejects—steel pickled in acid inhibited with Rodine has uniformly clean, bright surfaces, free of pits, blisters and smut.

LEARN MORE ABOUT ACP RODINE. Bulletin 1381 tells the complete story. Write for your copy today.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 19, Pa.

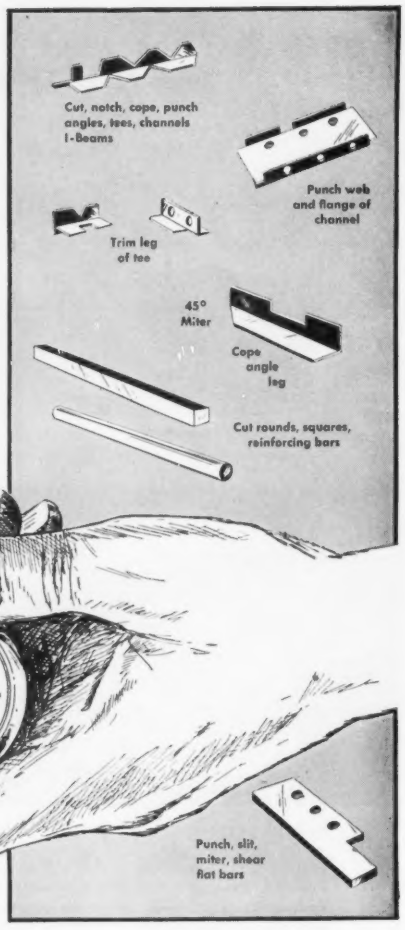
DETROIT, MICH. • ST. JOSEPH, MO. • NILES, CALIF. • WINDSOR, ONT.

CHEMICALS ACP PROCESSES

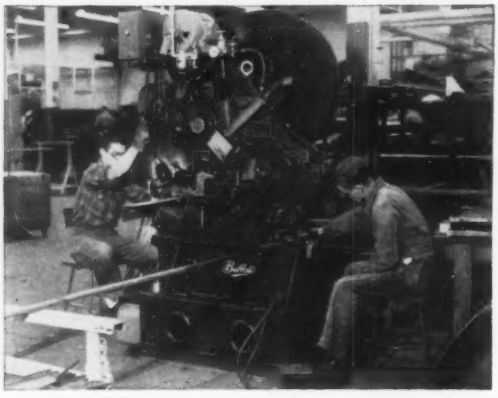
New Chemical Horizons for Industry and Agriculture

ALL THESE OPERATIONS ON ONE FAST MACHINE!

If your shop does two or more of the operations shown here, you'll be money ahead with a "Buffalo" Universal Iron Worker! Takes the space of one machine, does the work of six — two operations at once! No tool changes required. Built to take the strain and shock of your heaviest production or maintenance work, the frame is of rigid arc-welded heavy steel plate, and the one-shot lubrication system means minimum maintenance. Write for Bulletin 360 for details on the "Buffalo" Universal Iron Worker and its big brother, the "Buffalo" Unistructural Iron Worker for your heaviest structural work.

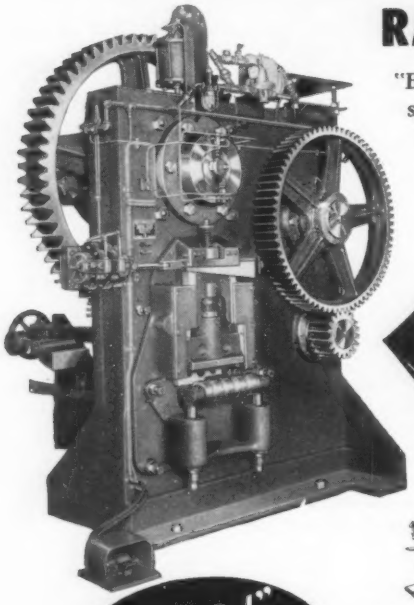

Cut, notch, cope, punch angles, tees, channels I-Beams
Punch web and flange of channel
Trim leg of tee
45° Miter
Cope angle leg
Cut rounds, squares, reinforcing bars
Punch, slit, miter, shear flat bars

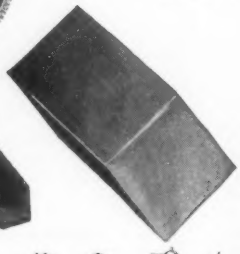
"BUFFALO" UNIVERSAL IRON WORKER

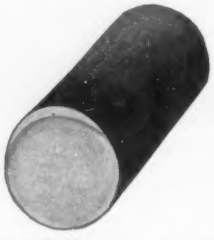


RAPID, CLEAN BILLET SHEARING!

"Buffalo" Billet Shears are saving money for forging shops by their high-speed dividing of round and square billets with clean, square cuts. Because the "shearing" is actually a straight *fracture*, there is no "smearing" to conceal possible porosity, as with burning or sawing — resulting in better inspection. 11 sizes to handle up to 10" rounds and 9" squares at 6 strokes per minute — correspondingly higher speeds in the smaller sizes. Write today for Bulletin 3295-C.







"BUFFALO" BILLET SHEARS

"Buffalo"

BUFFALO FORGE COMPANY

158 MORTIMER STREET — BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

Unsurpassed-anywhere!

IT ALL COMES DOWN to one fact... that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

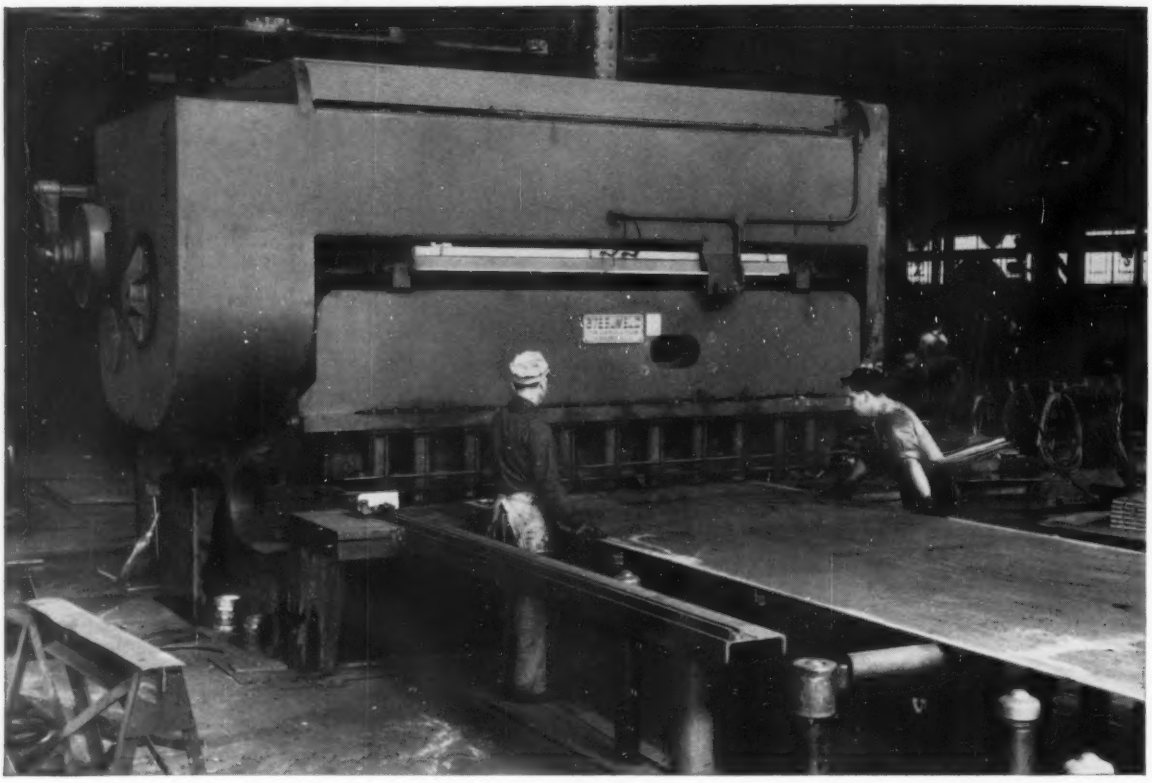
You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

California giant Sequoias—largest of all trees.

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N.Y.



Steel plates up to 10' x 1" are quickly cut on this Steelweld. A complete line of machines is available for every thickness from light gauge to 1½" and every length from 6'-0" to 24'-0".

Pivoted-Blade Shears Outstanding for Heavy Plates

WHILE Steelweld Shears are used in hundreds of plants for cutting every gauge of metal, it is on heavy plate where the easy accurate cutting action of the machine is really eye catching. With nothing more than a quick "oomph" the knife goes through the metal quickly and cleanly, seemingly without effort. The resulting cut edges are straight and sharp.

Steelweld Shears are now cutting steel up to 1½ inches thick. A wonderful feature is the ease and speed with which the heavy plate machines can be adjusted to cut the lightest gauge metal. In a matter of seconds the clearance between the knives can be reduced to that known to provide the best result for the thickness of the plate being cut. This is done simply by turning a crank until a gauge indicator is on the correct thickness figure. This feature is known as MICRO-SET knife adjustment and is the talk of the industry.

Production is fast on Steelwelds because they are heavily built to enable high operating speeds. Also, they are equipped with electric foot control. This reduces operator fatigue and often eliminates many steps he must take to the machine.

If you want the most modern machine, with outstanding features that make for the finest in all around performance — tried and proven features, some of which are not obtainable in any other shear — we invite you to get the facts on Steelwelds.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7847 East 282nd Street, Wickliffe, Ohio

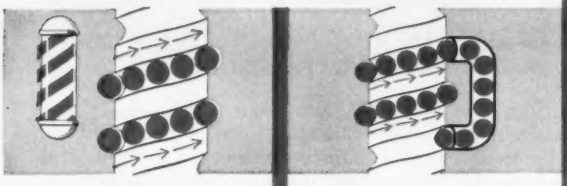
STEELWELD PIVOTED BLADE SHEARS

ACTUATION PROBLEM too tough for ordinary devices?

SAGINAW CAN HELP YOU SOLVE IT!

Saginaw b/b Screws guaranteed 90% efficient —offer 6 major advantages for designers

Available in custom machined and commercial rolled thread types—have been built from 1½ inches to 39½ feet long—⅜ to 10 inches diameter.



Nut *glides* on steel balls. Like stripes on a barber pole, the balls travel toward end of nut through spiral "tunnel" formed by concave threads in both screw and mating nut.

At end of trip, one or more tubular guides lead balls diagonally back across outside of nut to starting point, forming closed circuit through which balls recirculate.

1 VITAL POWER SAVINGS. With guaranteed efficiency of 90%, Saginaw b/b Screws are up to 5 times as efficient as Acme screws, require only ⅕ as much torque. This permits much smaller motors with far less drain on the electrical system. Circuitry is greatly simplified.

2 SPACE/WEIGHT REDUCTION. Saginaw b/b Screws permit use of smaller motors and gear boxes; eliminate pumps, accumulators and piping required by hydraulics. In addition, Saginaw b/b Screws themselves are smaller and lighter. Units have been engineered from 1½ in. to 39½ ft. in length.

3 PRECISE POSITIONING. Machine-ground Saginaw b/b Screws offer a great advantage over hydraulics or pneumatics because a component can be positioned at a predetermined point with precision. Tolerances on position are held within .0006 in./ft. of travel.

4 TEMPERATURE TOLERANCE. Normal operating range is from −75° to +275° F., but assemblies have been designed in selected materials which function efficiently as high as +900° F. These units are practical where hydraulic fluids have lost efficiency or reached their flash point.

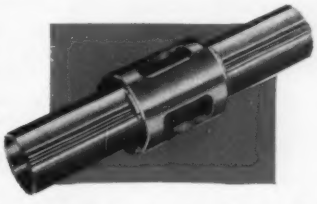
5 LUBRICATION LATITUDE. Even if lubrication fails or cannot originally be provided because of extreme temperatures or other problems, Saginaw b/b Screws will still operate with remarkable efficiency. Saginaw units have been designed, built and qualified for operation without any lubrication.

6 FAIL-SAFE PERFORMANCE. Far less vulnerable than hydraulics. In addition, Saginaw offers three significant advantages over other makes: (1) Gothic arch grooves eliminate dirt sensitivity, increase ball life; (2) yoke deflectors and (3) multiple circuits provide added assurance against operating failure.

YOUR FREE COPY OF THIS NEW b/b SCREW AND SPLINE "PROBLEM SOLVER" SHOWS HOW

36 pages crammed with time-, work-, and money-saving facts: Principles • Types • Basic Operations • Coupling Methods • Efficiency • Advantages • Selection Factors • Design Data • Sample Problems

SAGINAW b/b SPLINE



● Averages 40 times lower coefficient of friction than ordinary sliding splines!

Utilizing the same basic *gliding ball* principle, Saginaw has developed the *Saginaw b/b Spline* which radically increases the efficiency of transmitting or restraining high torque loads.

It can be fitted with integral gears, clutch dogs, bearing and sprocket seats, etc. Units have been built from 3 inches to 10 feet long—⅜ to 6 inches in diameter.

SEND TODAY FOR THIS FREE 1957 ENGINEERING DATA BOOK . . .

or see our section in Sweet's Product Design File

Saginaw ball bearing Screws and Splines

SAGINAW STEERING GEAR DIVISION OF GENERAL MOTORS

WORLD'S LARGEST PRODUCER OF BALL BEARING SCREWS AND SPLINES

Saginaw Steering Gear Division
General Motors Corporation
b/b Screw and Spline Operation
Dept. 7N, Saginaw, Michigan

Please send new engineering data book on Saginaw b/b Screws and Splines to:

NAME_____

COMPANY_____ TITLE_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Steel that goes into this bumper, being installed on one of America's fine cars, is ordered and tested to rigid specifications. The steel must be exceptionally clean, bright, flat, and with no surface defects. It must have close chemical analysis and internal quality so it will draw deeply without "orange peel." The company installing this bumper is so careful that in the last ½ million bumpers it has scrapped only ½ of 1% due to metal failure! Pittsburgh Steel's sheet constantly meets these exacting specifications.

Pittsburgh Steel's quality standards pay off as automakers in a highly competitive market demand...

Better Sheet Steel For Making Bumpers

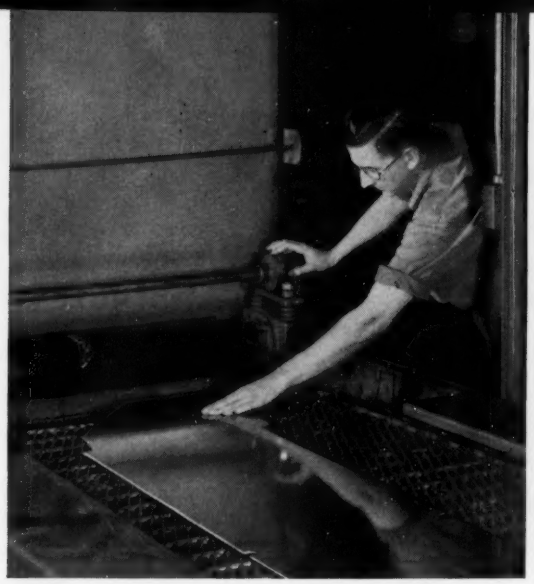
Today, the makers of America's better cars are more than just critical when they specify steel for making bumpers. They realize that the broad and complex chromed areas front and back on their models must enhance the appearance of the cars if they expect to beat competition in today's tight market. They demand the best, and then test exhaustively against strict specifications to make sure they get it.

That's where Pittsburgh Steel Company shines. With its outstanding new cold rolling facilities backed up with the latest technology, it daily produces sheet for a variety of the toughest applications. When an automaker says of its bumper stock that yield must be held to 30-33,000 psi, and elongation must be 38% before failure—that's duck soup for Pittsburgh Steel. Orders like this come from one company that prides itself on less than one-half of one percent of scrap due to metal failure in the last half-million bumpers!

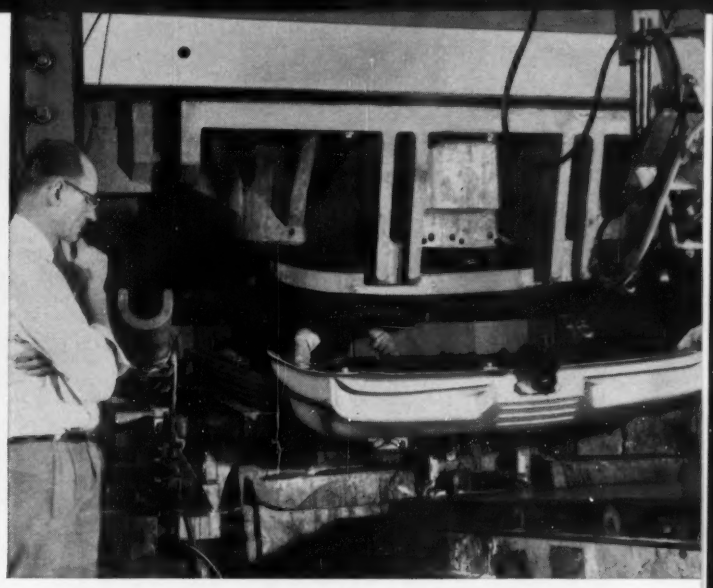
One bumper plant inspector put it this way: "We have to be especially careful to watch steel quality because, although the draw isn't unusually deep on wrap-around bumpers, it is very critical since it involves complex bends up to 120°. And even the tiniest stretcher-strain marks or other defects would show up like a sore thumb under the bright chrome finish."

If Pittsburgh Steel's sheets can meet standards as high as these, they can help you solve your forming problems, no matter how tough they may be. When you buy from Pittsburgh Steel you can always be sure you are getting sheet that has:

(Advertisement)

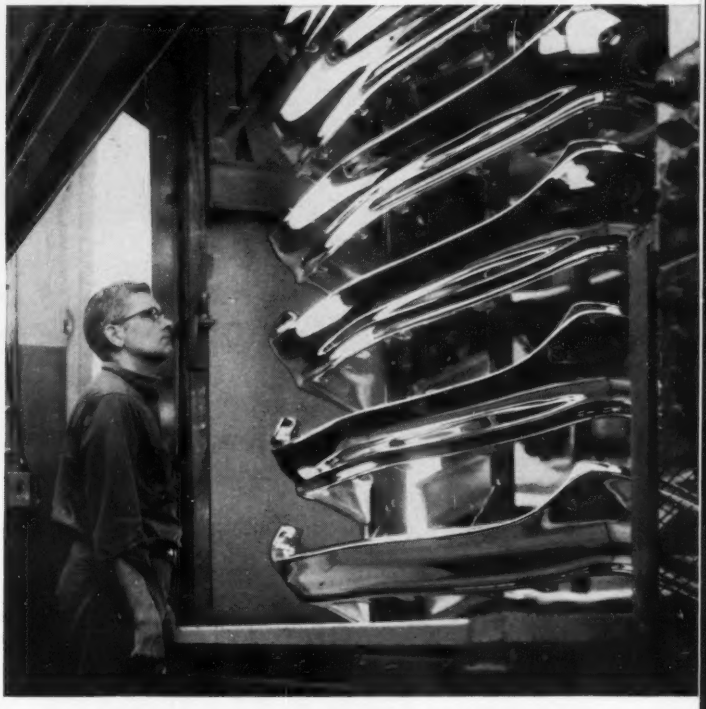


Grinding provides a surface finish which must not deviate more than 10 micro inches and since rarely more than 2% is taken off, the original sheet surface had to be excellent.



The draw of this massive press is critical since complex angles up to 120° must be achieved without steel failure. Sheet steel supplied by Pittsburgh Steel Company has excellent formability which stems from good internal quality.

After all drawing and stamping operations are complete, each bumper is carefully inspected before going to the plating line.



Each bumper gets a last close look after plating. The bright finish magnifies any defects so the surface must be perfect.

- **Superior Internal Quality**—proper uniform grain structure free from flaws and subsurface imperfections.
- **Good Surface**—clean, bright and smooth—free from scratches, pits and slivers.
- **Flat and Uniform**—consistent from sheet to sheet to save you scrap.
- **Formability**—excellent capacity to withstand deep drawing.

There is an experienced Pittsburgh Steel Company sales engineer as close to you as your telephone. He is at your service—eager to help you solve your toughest sheet problems.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

(Advertisement)

Another Plus . . . from Brainard

"INTEGRATION" An Extra Assurance of Quality in Brainard Steel Strapping . . .

The word integration has a special meaning in the industrial vocabulary. An integrated company has come to mean one that gives something extra in quality, delivery, and performance.

As a division of Sharon Steel, Brainard can be sure that the steel used for strapping has been developed to meet their own exacting standards. From mine to finished product, Brainard Steel Strapping has that extra quality that can come only from an integrated industry.

The Brainard strapping line includes over 378 items to provide you the finest modern strapping facilities. Brainard trained sales engineers are on call in every major city to help you with your strapping problems.

Brainard Steel Strapping

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

305

SCREWSTICK is easy to insert into power driver, lets you drive a fastener as fast as you can find the hole.

SCREWSTICK saves money. It can cut assembly costs by as much as 4 to 1

It can do this because SCREWSTICK feeds fasteners automatically from a power driver in a one-piece stick of identical fasteners. It eliminates manual handling of small screws, stops costly fumbling and combines high fastening strength with quick assembly.

Just as important is the ease of alignment between the screw and threaded hole and a constant, measured torque which is built into the product that provides uniform tightening.

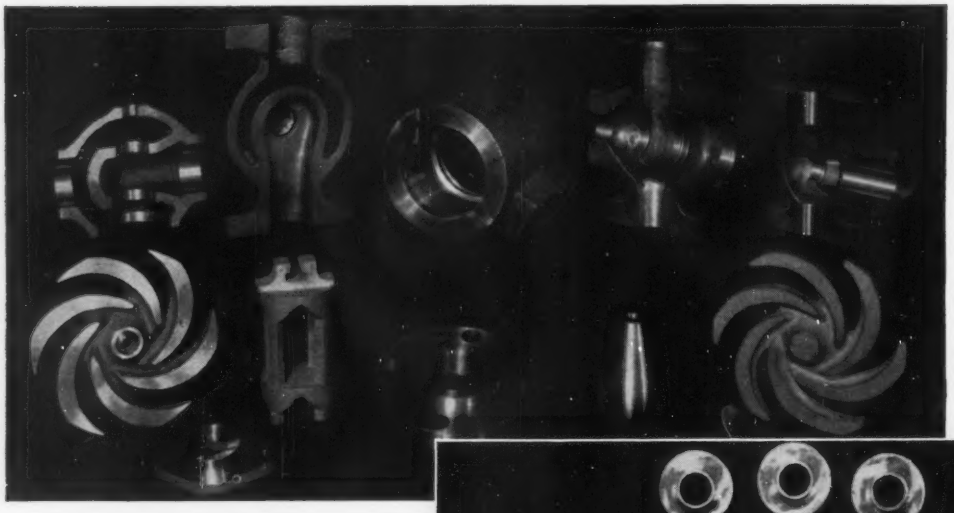
SCREWSTICK is readily adaptable to compact, lightweight, portable drivers. Sizes from No. 0 to No. 6 in diameter, custom-engineered in machine screw or self-tapping types to meet your own requirements. They are mass-produced in the convenient, easy-to-handle SCREWSTICK form.

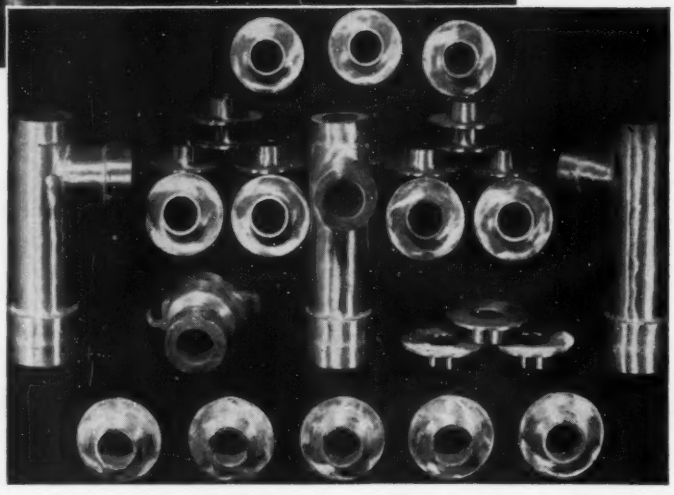
Find out for yourself how you can apply precision and ease of assembly to reduce assembly costs. Take advantage of American's custom engineering service for your fastening applications.

The biggest news in fasteners comes from . .

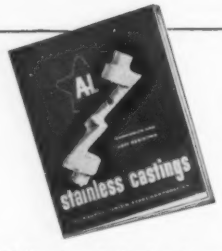
American!

AMERICAN SCREW CO., WILLIMANTIC, CONN.
NORRISTOWN, PA. • CHICAGO, ILL. • DETROIT, MICH.





This is the mark that means clean, sound Stainless Castings all the time



Write for this book on A-L STAINLESS STEEL CASTINGS

28 pages of valuable and complete data on stainless castings: analyses, properties, technical data on handling and heat treatment, typical applications, how to order, etc.

ADDRESS DEPT. S-901

Every stainless casting produced by our Buffalo Foundry carries the familiar A-L Star trademark, cast into the steel. That means it's Allegheny Ludlum *time-tested* stainless steel—a pioneer that has successfully answered thousands of difficult corrosion and heat resisting problems.

It not only means experience in stainless casting applications, but in maintained high quality, too. The A-L Buffalo Foundry is a pioneer in both the vertical-centrifugal and static methods of casting stainless steel. You can depend upon Allegheny stainless castings to be strong, clean-surfaced, sound-structured and easy-machining . . . fully in accord with the service conditions and with your requirements for delivery.

Let our stainless foundry specialists quote on *your* casting needs—any size, up to thousands of pounds—regular production quantities or problem jobs. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

WSW 6535

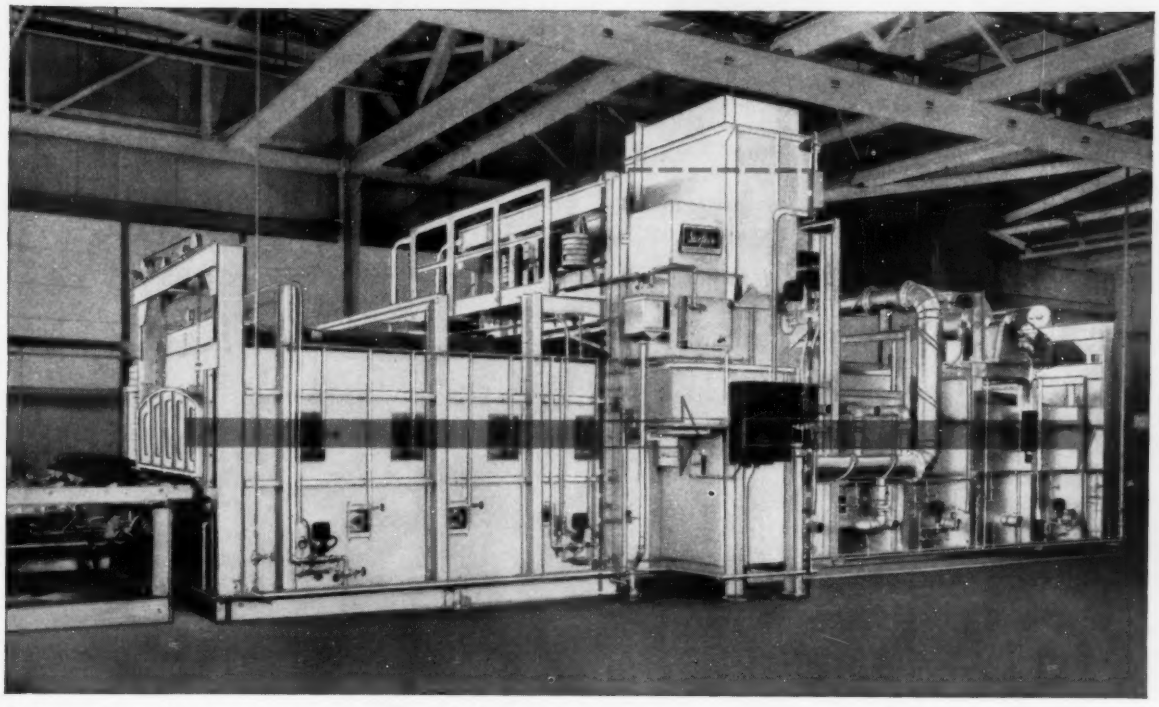
Make it BETTER—and LONGER LASTING—with

Allegheny Stainless

AL ALLEGHENY LUDLUM ®

Warehouse stocks carried by all Ryerson steel plants

Superfast cooling for cycle annealing



A furnace-within-a-furnace makes this Surface cycle annealer one of the most versatile heat treat units in the country. It anneals, cycle anneals, and normalizes gear forgings of different size, shape, and alloy at the net rate of 864,000 lbs. per month or better.

Such exceptional versatility is achieved by a superfast cooling zone. Really a full convection furnace within a direct-fired furnace, this zone is isolated by refractory doors. It can be used or by-passed, depending on which of many cycles the customer wants. As a result, the customer can heat treat as many as 13 different alloys in this one furnace.

Adding to the flexibility of the furnace is a modular tray design. Each module is an 18x20-inch chrome alloy casting. Modules can be combined to hold any size of work up to 800 pounds. They are also used to carry work outside the furnace.

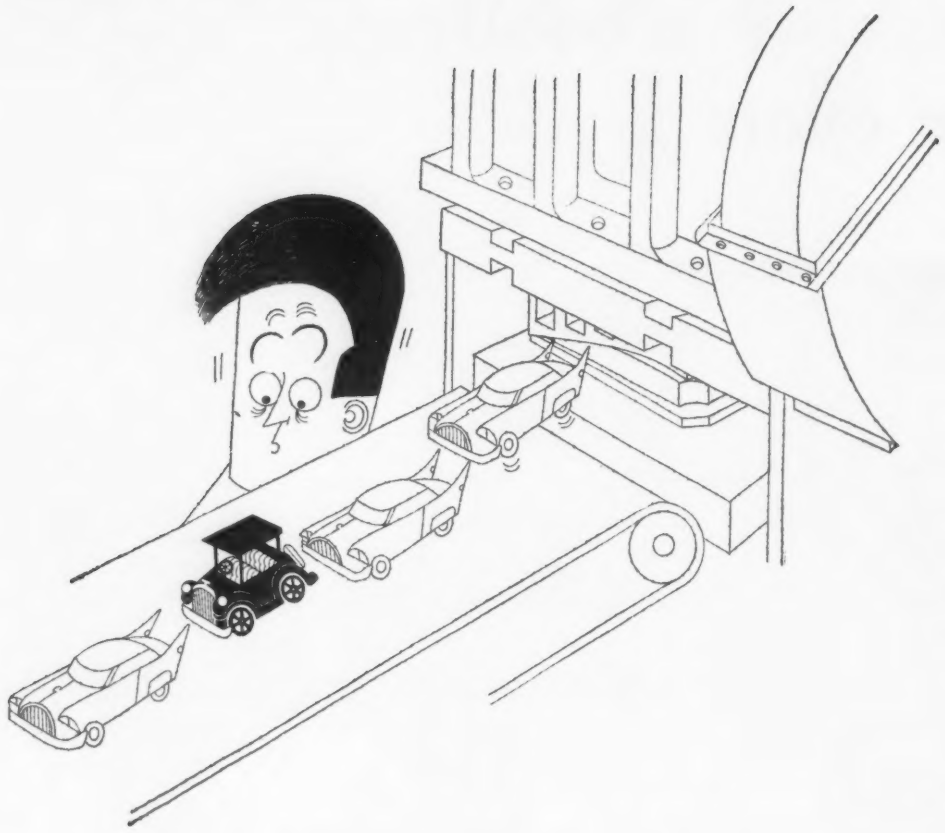
This furnace-within-a-furnace is another proof that Surface engineers are old hands at creating new ideas in heat treating.

Write for Bulletin SC-146 on cycle annealing.

Surface Combustion Corporation, 2385 Dorr St., Toledo 1, Ohio. In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.

wherever heat is used in industry

Surface®



Got a forming problem?

SOLVE IT WITH CRUCIBLE KETOS. IT'S A NON-DEFORMING, OIL HARDENING TOOL STEEL, WHICH USERS FIND UNBEATABLE. YOU CAN GET IT QUICKLY FROM LOCAL CRUCIBLE WAREHOUSE STOCKS.

Crucible KETOS is especially suitable for blanking and forming dies. It has a wide heat treating range—low hardening temperature—minimum decarburization—and is non-deforming.

KETOS is one of dozens of special tool steels regularly stocked at Crucible warehouses. Deliveries are prompt in the sizes you want.

And Crucible offers you more than steel. You have the service of an industry-experienced staff of specialists to assist in the selection and fabrication of special steels. That's because Crucible is the only specialty steel producer *fully integrated to the point of use*. That means control and responsibility from raw material to warehouse delivery to you.

STOCKS MAINTAINED OF:

Rex High Speed Steel... ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars)... Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes)... Max-el, Hy-Tuf, AISI Alloy... Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

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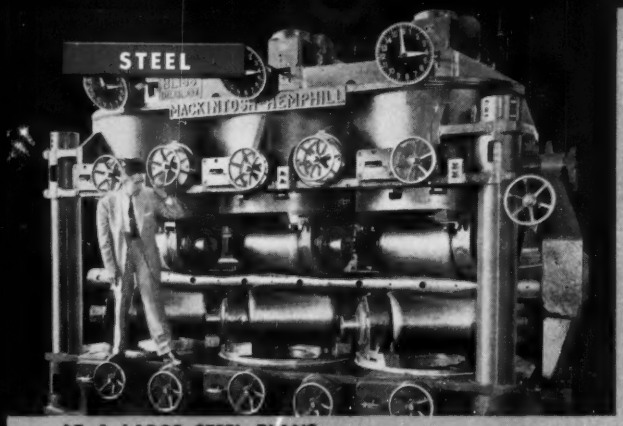
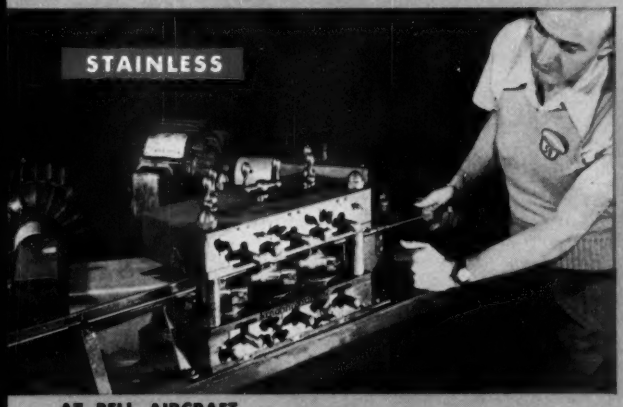
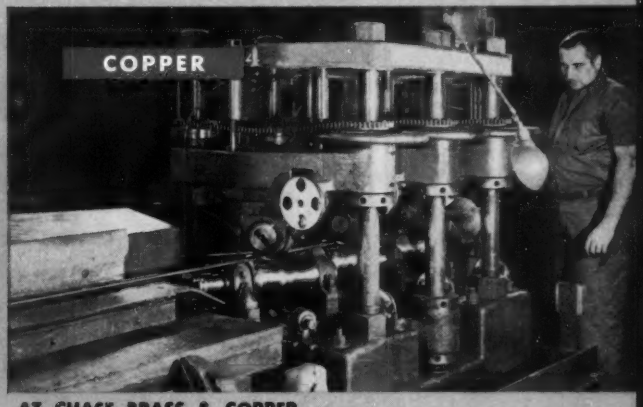


AT A LARGE STEEL PLANT...
This A-5 recently shipped to an eastern steel plant is the largest 6-roll straightener in the world; straightens electric-weld steel pipe in diameters between 4½" and 16", in 16-to-65 foot lengths at speeds up to 240 feet per minute. It illustrates the three-post design now available in large models of the Mack-Hemp straightener.

AT ALCOA...
This Model AX has recently gone into operation at Alcoa's New Kensington, Pa., plant. It straightens from 100 to 150 tons of aluminum alloy tubing every month. Guideless design and power drive to all six rolls enable Mack-Hemp to successfully production-straighten easily-marked aluminum tube.



AT BELL AIRCRAFT...
At this aircraft producer's Buffalo plant, this three-post Model AY straightens 3/16" O.D. 304 Stainless Steel tubing which Bell makes into rocket engine components. The machine raised Bell's straightening capacity from 570 feet to nearly 7500 feet per day...more than *thirteen* times as much!



AT CHASE BRASS & COPPER...
This Model AN, with capacity of ½" to 3" O.D. is one of three Mack-Hemp straighteners at Chase's Cleveland plant. The Models AXY, AX and AN together provide overlapping capacity for 3/16" up to 3" O.D., in straightening brass or copper tube and in "light tempering" annealed copper tube.

For premium tube straightness and roundness at high production speeds...

The MACK-HEMP Guideless Rotary Tube Straightener

- All six rolls driven—no guides—surface of straightened tubing is unmarked.
- Eliminates end bends and ovality; provides premium straightness and roundness over full length of tube.
- Rugged, heavy-duty construction.
- Models for all O.D.'s from 0.050" to 16" of ferrous and non-ferrous pipe and tube.
- Speeds up to 800 feet per minute.
- Easy to reset for different diameters—all models now available in three-post construction. Fast roll adjusting mechanism is enclosed and protected from scale and water.

ALL MODELS ARE NOW AVAILABLE IN MACK-HEMP'S EXCLUSIVE THREE-POST CONSTRUCTION

For complete details on Mack-Hemp Straighteners, write today for a free copy of our 24-page Technical Bulletin No. 55, "How to Straighten Pipe and Tube."

MACKINTOSH-HEMPHILL
DIVISION OF E. W. BLISS COMPANY

BLISS

Makers of the rolls with the Striped Red Wabblers

Pittsburgh and Midland, Pa.

CAST MILL ROLLS • JOHNSTON CINDER POTS • ROTARY TUBE STRAIGHTENERS • END-THRUST BEARINGS • HEAVY-DUTY LATHES • STEEL AND SPECIAL ALLOY CASTINGS

A Multipress case study

How to automate production

Multipress® curbs costs of Dormeyer mixer parts . . . triples output by integrating three separate operations

Often, a series of operations can be combined to both improve product quality and cut production costs. This was the experience of Haber Corp. when they streamlined production of beater spindles for their Dormeyer automatic food mixers.

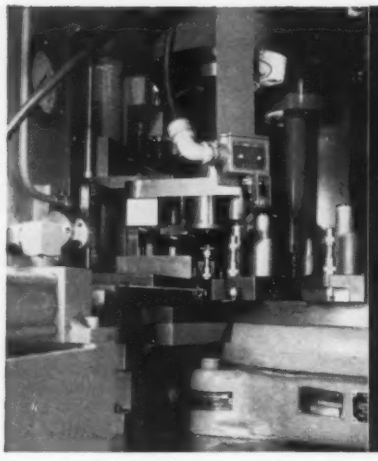
By reducing the size variations of slots cut into the spindles and thus eliminating the need for deburring, quality was boosted . . . costs cut.

A special 8-ton hydraulic Multipress was selected to combine three machining operations. Only loading parts on the 12-station hydraulic index table is performed manually. Once the cycle-start button is pressed, the parts advance step-by-step until a small flange-mounted cylinder ejects the finished beater spindles.

In separate manual operations, production rates of from 200 per hour for cutting slots to 450 per hour for deburring had been standard. With Multipress, a continuous flow of 1020 beater spindles per hour is achieved with only one operator.

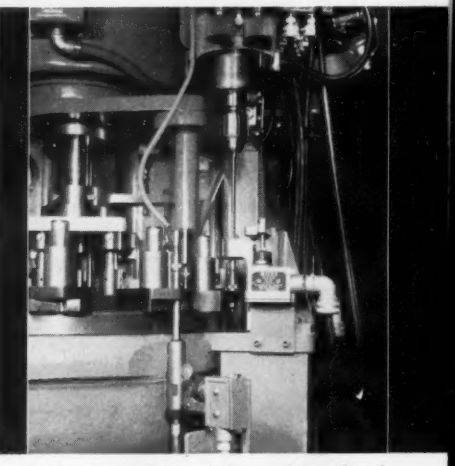
Advance cost analysis estimated that equipment and tooling would be amortized within a year due to increased production and quality. Actual production proved this estimate too conservative.

Find out how Denison hydraulic Multipress can perform a three-in-one job for your company—improving quality, speeding production and cutting costs. Write to Denison Engineering Division, American Brake Shoe Co., 1180 Dublin Road, Columbus 16, Ohio.



Ram descends to shear four slots, then holds down under full pressure as side cylinder advances broach for .050 slot. Chips are trimmed at next ram station.

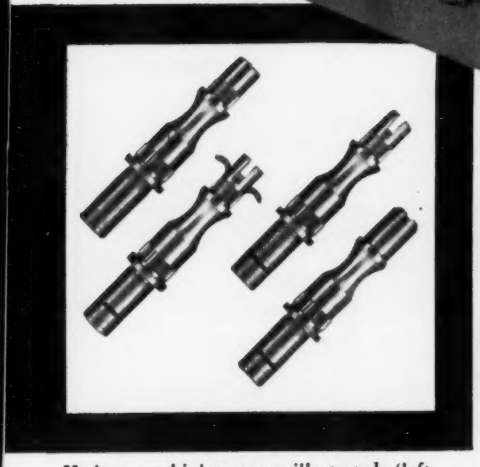
Next, spindle receives hopper-fed sleeve under transfer mechanism. Sleeve is pressed over spindle end by a cylinder activated by descending ram.



In final operation, spindle is clamped and center hole reamed through by drill head. Flange-mounted cylinder then ejects spindle from fixture.

hydraulically

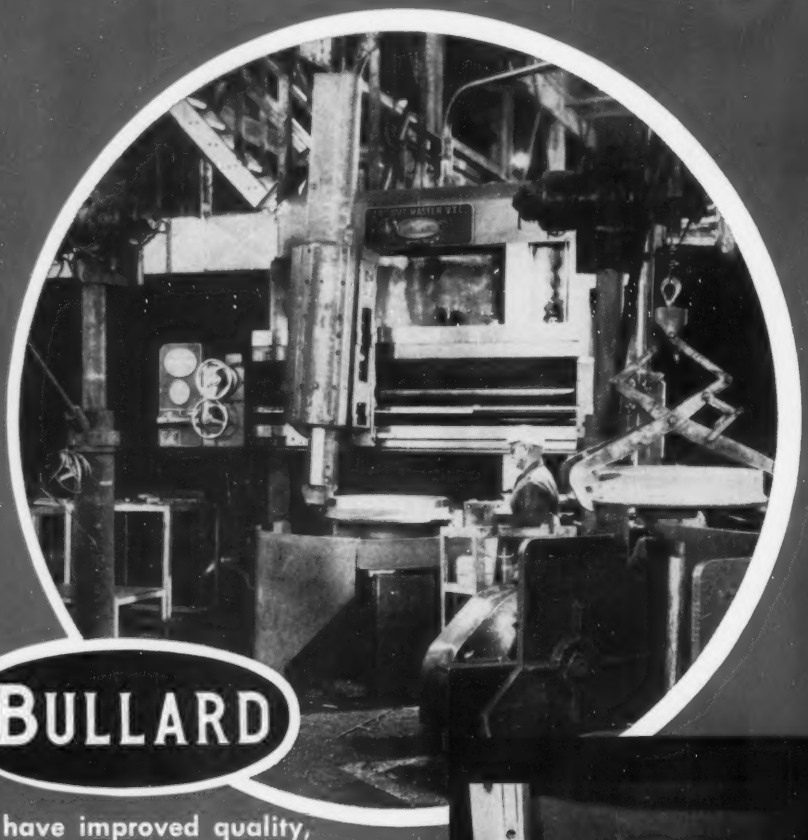
8-ton hydraulic Multipress equipped with 12-station index table. Index table is mounted over special bolster on 22-inch work circle, to which is attached one-ton capacity, foot mounted hydraulic cylinder with 12-inch stroke.



Various machining stages illustrated: (left to right) spindle prior to slotting; after shearing slots, showing chips; after trimming of slots; with sleeve pressed into place.

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

DENISON Hydr OIL ics



BULLARD

We have improved quality, quantity and appearance of our product with . . .

BULLARD MAN-AU-TROL
MODEL 75

This has been accomplished by one of the nation's largest manufacturers of railroad car wheels.

The plant superintendent tells us "that improved quality is obtained through greater machining accuracy – that quantity is improved with Man-Au-Trol, Model 75 since each operator can machine 76 pieces per eight hour shift compared to 40 pieces by our former method – that appearance is improved because of superior finish obtained by using single point cutting tools instead of ground formed tools."

How about you? Are you employing all the advantages offered by Bullard Man-Au-Trol, Model 75, to your machining problems.

To cut costs when cutting metal . . . buy BULLARD

Call your Bullard Sales Engineer, he's as near as your telephone or write

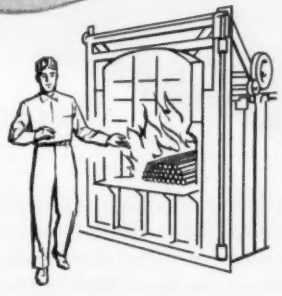
THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Stainless by Standard

TUBE SIZES
¼" OD to 4-¾" OD
-.025 to .165 wall
STANDARD TUBE CO.
PIPE SIZES
SCH. 40 ⅛" to 2" I.P.S.
SCHS. 5 & 10 ⅛" to 4" I.P.S.
ALL ANALYSES
STANDARD TUBE CO. TYPE 304-L

ANNEALED

Full annealing is one reason why you get the maximum corrosion resistance in each foot of Standard pipe or tubing.



Standard Welded Stainless Pipe and Tubing is formed from only the finest strip steel with every emphasis on uniformity and quality. It is welded by the inert gas shielded arc process. No flux or filler metal is added. Then fully annealed to eliminate stresses and assure uniform structure and maximum resistance to corrosion.

Standard pipe and tubing is produced in a wide range of sizes and grades. Bring your stainless tubing problems to STANDARD . . . rest assured you'll get only the *highest STANDARD* in welded tubing and pipe.

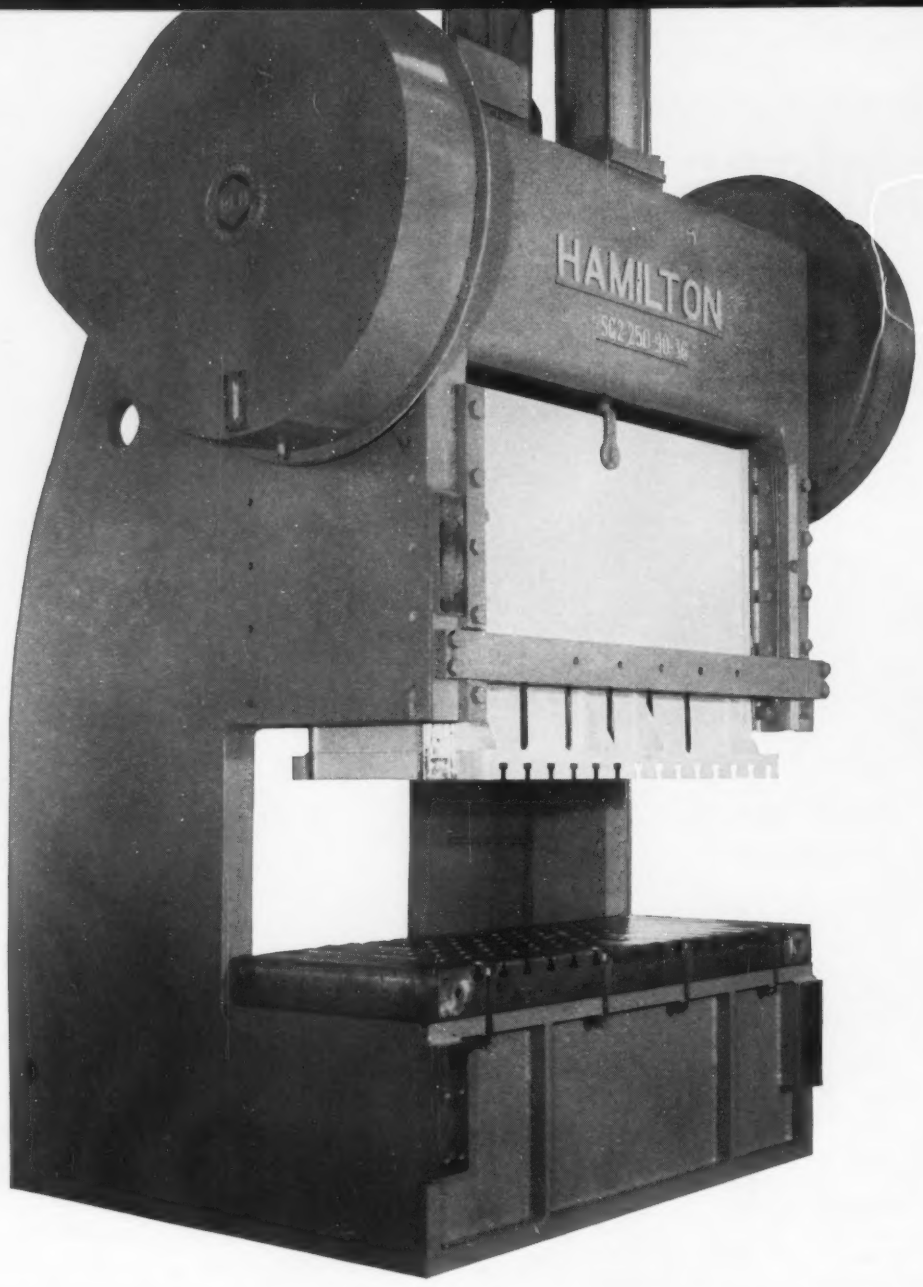
Free 8-page folder on all Standard products. Write Address below.

STANDARD

THE STANDARD TUBE COMPANY

24400 PLYMOUTH ROAD • DETROIT 39, MICHIGAN

Welded stainless tubing and pipe • Welded carbon steel mechanical • Boiler and heat exchanger • Exclusive rigidized patterns • Special shapes • Steel Tubing—Sizes ½" OD to 5½" OD—.028 to .260 wall • Stainless Pipe—Schedule 40: ⅛" to 2" I.P.S.; Schedules 5 and 10: ⅛" to 4" I.P.S.—Stainless Tube—¼" to 4¾" OD—.025 to .165 wall



Hamilton press line expanded to include medium size presses

Pictured above is a new Hamilton Gap Press recently installed at the Eaton Manufacturing Company, Cleveland, Ohio. This new large-bed press stamps out the larger grille guards which the latest model cars are calling for.

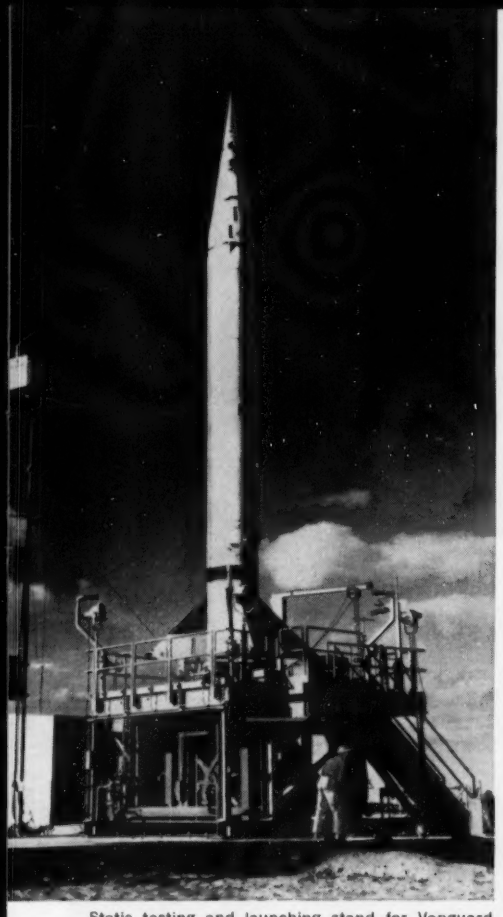
The capacity of this press is 250 tons and the speed 28 to 30 strokes per minute. Bed area is 90 in. right to left; 36 in. front to back. It is one of a new line of single and double-crank presses ranging from 100-300 tons capacity.

Write to Hamilton Division, B-L-H Corporation, for full information and specifications on this new line of heavy duty Hamilton presses.

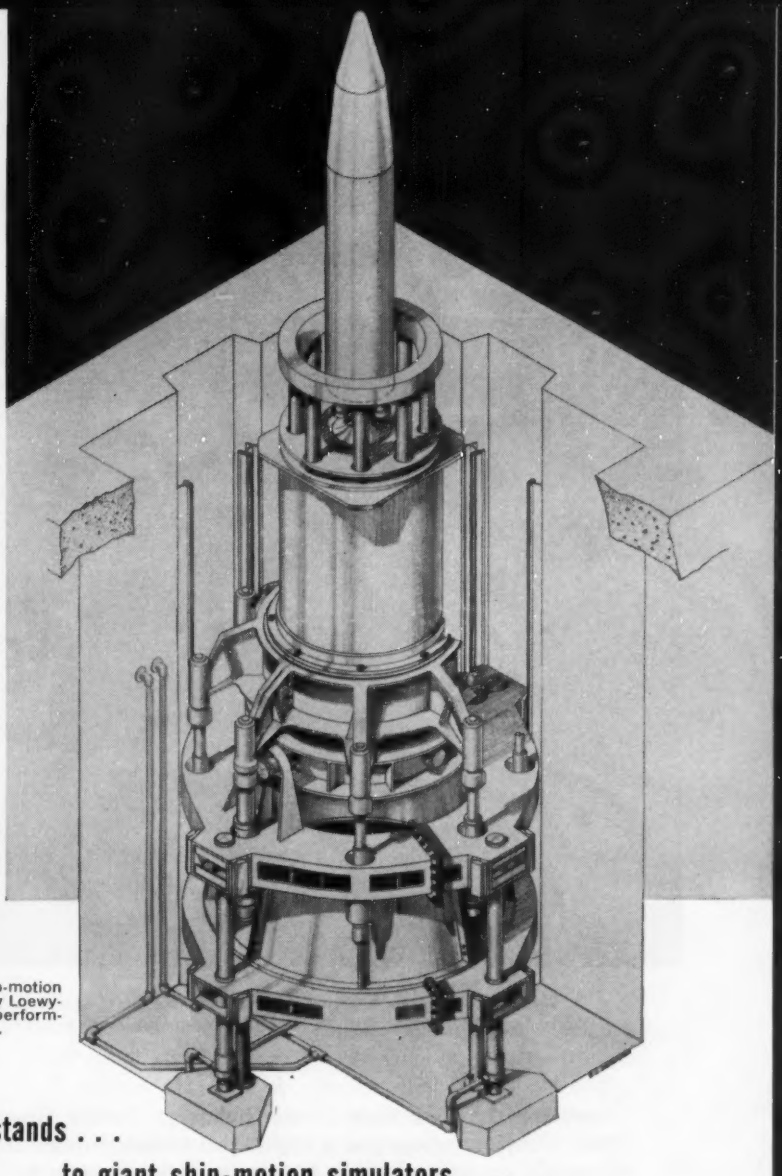
Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools



Static testing and launching stand for Vanguard Earth Satellite and Rocket designed and built by Loewy-Hydropress. Prime contractor—The Martin Company, Baltimore.



Engineer's isometric drawing of ship-motion simulator, designed and being built by Loewy-Hydropress, which will evaluate the performance of the Navy Fleet Ballistic Missile.

From static testing and launching stands . . .

to giant ship-motion simulators . . .

Loewy-Hydropress creative engineering finds the solution

Loewy-Hydropress, which designed, built and installed the static testing and launching platform for the earth's first man-made satellite, has designed and is now building an enormous simulator to duplicate ship motions for the Navy Fleet Ballistic Missile Program. Involving several significant advances in the concept of automatic control of large forces, this simulator will be used for the purpose of checking guidance and fire-control systems, as well as handling, checkout, and actual firing procedures for ship-launched missiles.

The major function of the simulator will be to determine the limiting conditions under which a missile can be safely launched from a moving platform without interference from that platform. In so doing, this elaborate device will duplicate a periodic roll and pitch in any direction while simultaneously producing a heave motion. The simulator's supporting auxiliaries and environment—also by Loewy-Hydropress—will help create an integrated, functional and versatile research tool for the Navy.

The same talents responsible for the earth satellite launching platform and the ship motion simulator are available to help you solve your missile ground-support problems. Whether test facilities, or launching stands, or a combination of both, Loewy-Hydropress will supply a complete ground handling system.

If your missile contracts require creative engineering and design, research and development, direct your inquiries to us, Dept. B-6.

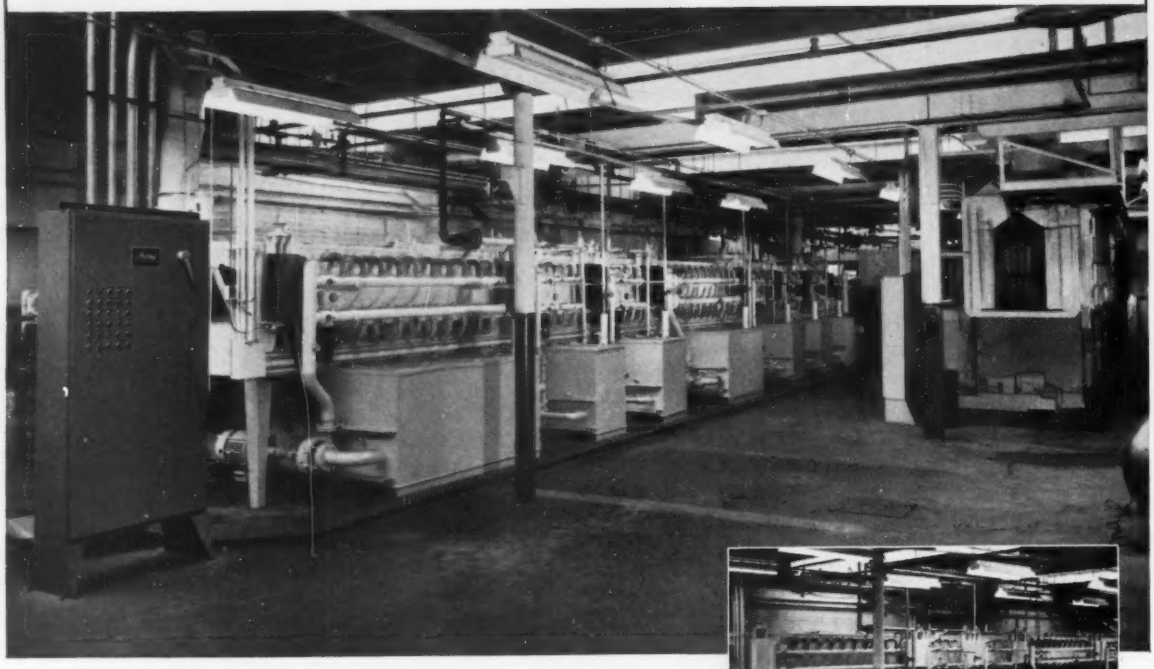
Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

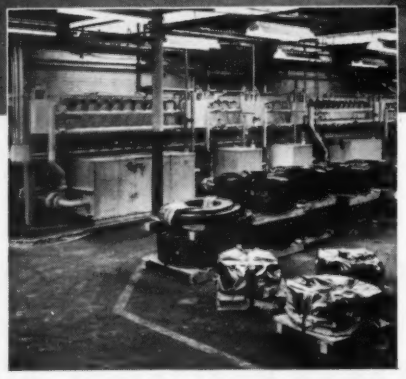
111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON

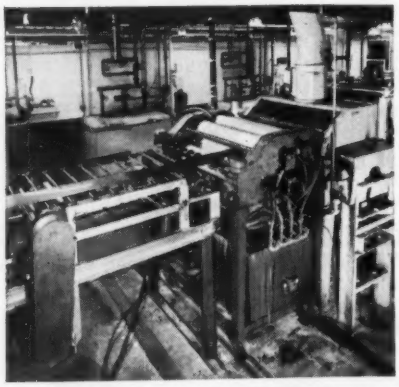
First in the Nation



1. 75-foot continuous treatment strip machine, left, and automatic Spra Bonderite, right, in Parker's new customer service lab.



2. Tons of steel in coils await treatment in the strip and sheet treating machine.



3. Bonderlube is applied over Bonderite treatment for cold forming sample. Roller coating section at end of strip machine is interchangeable.

Now, for the first time in the industry, Parker Rust Proof Company brings you a way to test surface treatment of metals on a production line basis, *before* you install surface treatment equipment in your plant.

You can save time, trouble and money by making use of the extensive research facilities of Parker's unique new customer service laboratory. It's a research lab with production line equipment, run like a production line.

This automated lab can treat sample stock by the ton. It is equipped to prepare samples and conduct tests involving all of Parker's varied and outstanding surface treatments of metals.

If you have a metal surface treatment problem, you are cordially invited to make use of this new testing service. Just contact your nearest Parker representative, or write or call Parker Rust Proof Company.

PARKER
RUST PROOF COMPANY
2158 E. MILWAUKEE, DETROIT 11, MICHIGAN

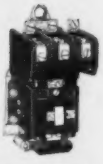
Since 1914—leader in the field

"Our customers prefer

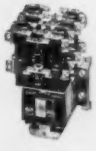
ALLEN-BRADLEY"

Bulletin 709
Solenoid Starters—
available in 8 sizes
up to 300 hp, 220 v;
600 hp, 440-550 v.

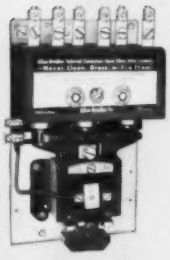
A-B Quality



Bulletin 702
Solenoid Contactor
Size 1



Bulletin 700
Solenoid Relay



Bulletin 702
Solenoid Contactor
Size 3

Bulletin 800T
Oiltight Push Button

Bulletin 800T
Oiltight Selector Switch

Among leading manufacturers of machine tools, Allen-Bradley Quality motor starters are the favorite—as shown by many independent preference studies. Having the Allen-Bradley Quality trademark appear on your equipment means automatic customer acceptance.

The "simple design" of Allen-Bradley motor control . . . with only *one* moving part . . . guarantees reliable operation. The double break, silver alloy contacts—used in all Allen-Bradley controls—are always in perfect operating condition. Even inspection time—let alone maintenance time—is saved.

No matter what your control requirements may be, they can be met with standard components listed in the Allen-Bradley Handy Catalog . . . Allen-Bradley control specialists can help you with your control problems. *Standardize* on Allen-Bradley Quality motor control . . . add this sales asset to your production machines!

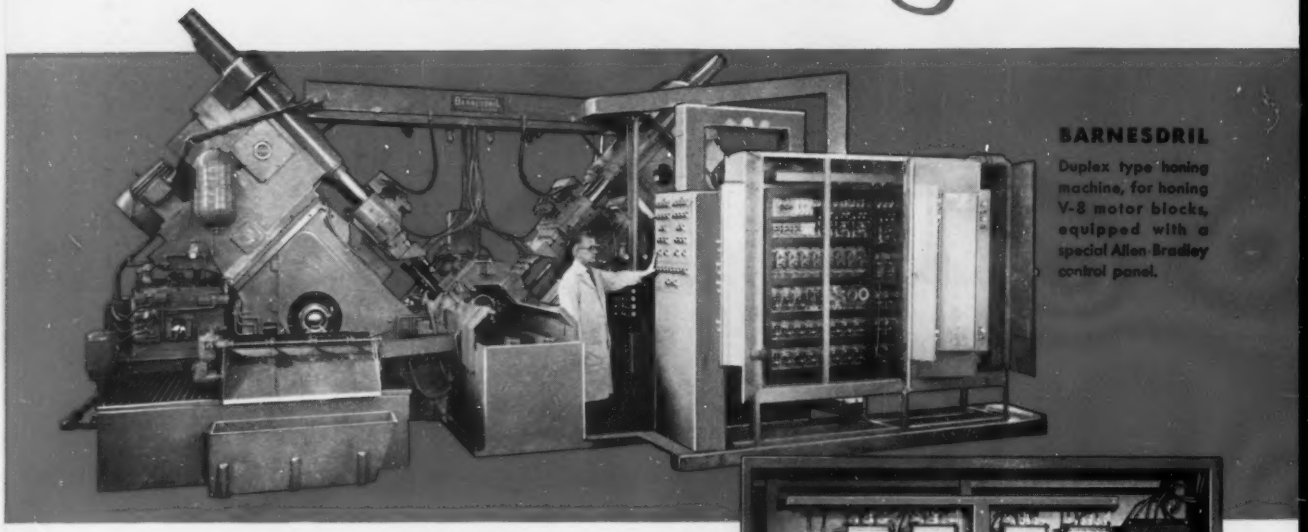
ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

5-57-R

for reliability... plus consistent operation

SPECIFY Allen-Bradley



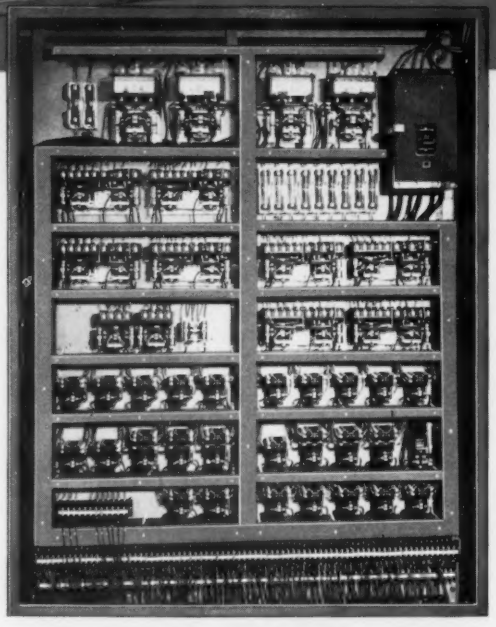
BARNESDRIL
Duplex type honing machine, for honing V-8 motor blocks, equipped with a special Allen Bradley control panel.

The motor controls on your automatic machines must be reliable when the machines are new . . . and remain reliable when the machines are old. When the sequence of operations is short, the controls must be instantaneous and consistent in their operation . . . or production has to be slowed down to the maximum variation in time of contactor operation. Sluggishness of a single component . . . even for a split second . . . may mean costly repairs and work spoilage.

Reliability is an integral part of all A-B motor controls. The simple solenoid design . . . with only one moving part . . . assures millions of trouble free operations. The double break, silver alloy contacts never need service attention.

Let Allen-Bradley help you with your special control problems. As you know, "quality" and "cheap" are two "teams" never in the same league.

Please send for the new Allen-Bradley Handy Catalog.



Motor control panel for a Barnesdril honing machine made from standard Allen-Bradley control units listed in the Allen-Bradley Handy Catalog.

5-57-R

A-B Quality

BULLETIN 849
"On-Delay"
Pneumatic Timer

BULLETIN 802T
Adjustable Lever
Oiltight Limit Switch

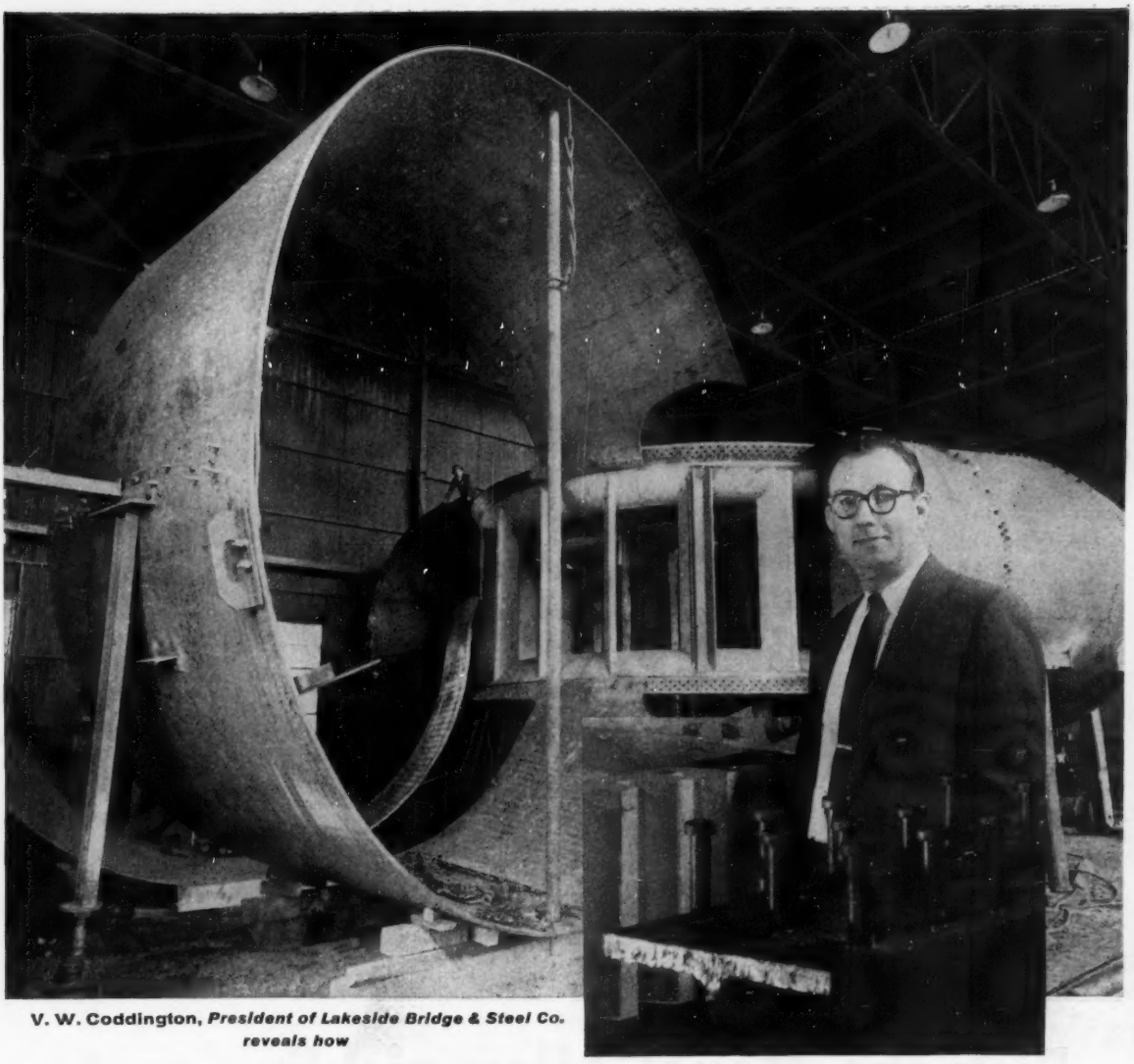
BULLETIN 709
Automatic
Solenoid Starter

BULLETIN 700
Universal Type
Solenoid Relay

BULLETIN 800T
Oiltight Push Button
Station

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.



V. W. Coddington, *President of Lakeside Bridge & Steel Co. reveals how*

"We now save $9,257 on insurance annually with 'Automatic' Sprinkler fire protection!"

"Total annual insurance cost for our structural steel and plate fabricating plant at Milwaukee—before we installed 'Automatic' Sprinklers—was $10,659.

"After we installed 'Automatic' Sprinkler fire protection we were able to reduce our insurance premiums to just $1,402 annually.

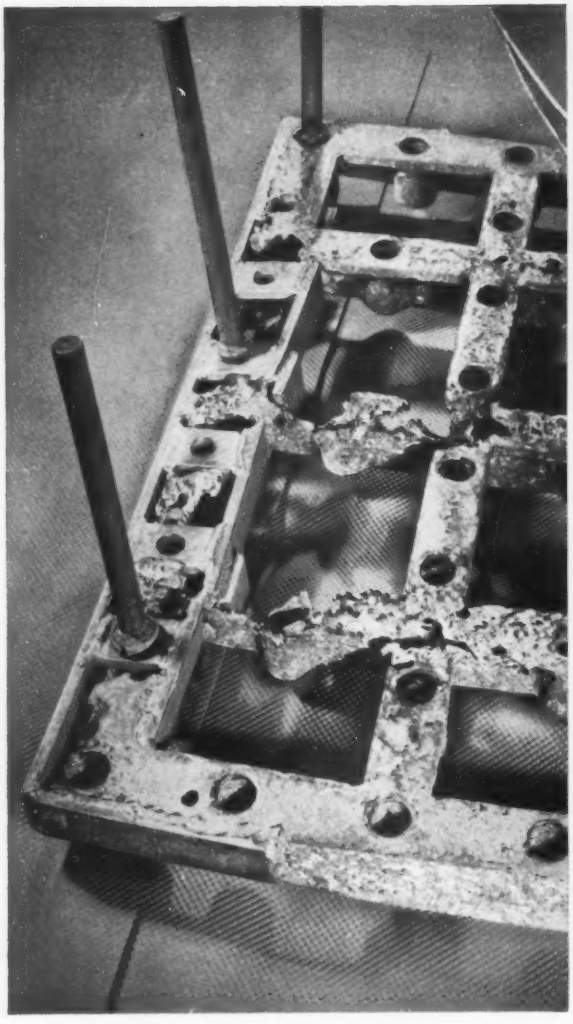
"The $9,257 insurance saving 'dividend' we now appreciate each year was made possible by our investment in an 'Automatic' Sprinkler fire protection system at a cost of $50,000.

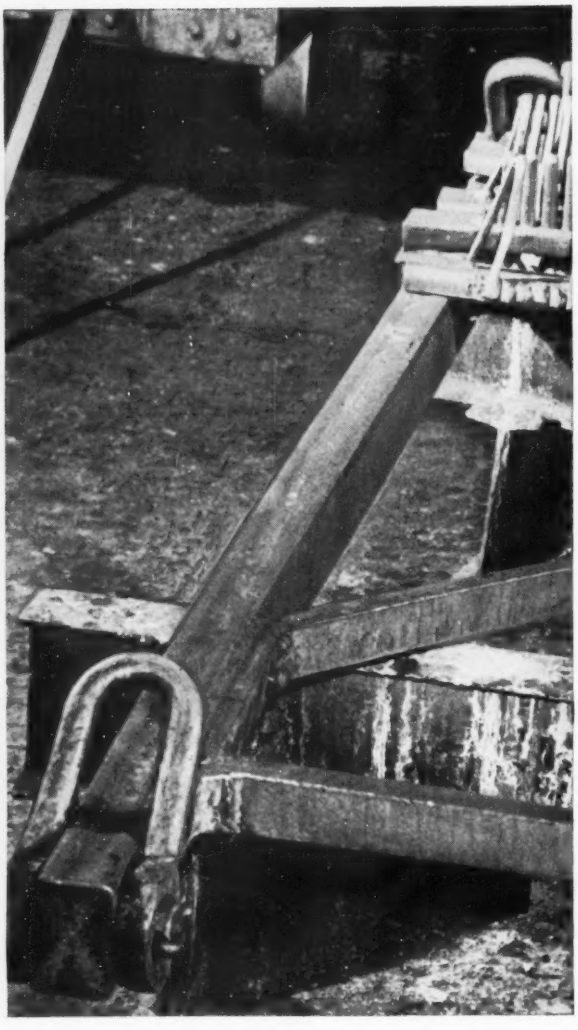
"And with proven 'Automatic' Sprinkler fire protection safeguarding our fabricating, machine shop and painting operations day and night, we now appreciate complete peace-of-mind from serious business interruption due to fire."

WRITE FOR NEW BROCHURE
"How investment in fire protection pays dividends".

"Automatic" Sprinkler **CORPORATION OF AMERICA**

YOUNGSTOWN 1, OHIO • OFFICES IN PRINCIPAL CITIES OF NORTH, CENTRAL AND SOUTH AMERICA





Pick the Monel Alloy pickling crate

You can see at a glance which crate is Monel* nickel-copper alloy. It's at your right . . . and is almost 30 years old!

You can also see which crate maintains its strength and stands up against acid corrosion by the pickling bath.

But in the early stages both crates would have appeared equally strong.

In the early phase of acid attack, de-zincification – or de-aluminification – remains unseen. Only a fraction of the original strength is left. The weakness shows up later as corroded "honeycombed" metal.

Monel alloy on the other hand cannot de-zincify. It is a solid alloy of nickel and copper.

In one public test, after exposure for 2,448 hours to 5% to 7% H_2SO_4 at 180°F., Monel alloy tie rods tested better than three times as strong as the next best metal under test.

In actual use, Monel alloy pickling crates maintain their strength and ability to carry extra heavy loads for years on end. Monel alloy strongly resists attacks by most of the common pickling solutions.

Monel alloy pickling equipment is wrought metal.

It can be fabricated to any practical design. And is easily repaired by welding for extra years of service.

Send for "Equipping the Pickle House for Greater Production at Lower cost." Write today!

*Registered trademark

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO Nickel Alloys

Monel . . . *for proved pickling life*

Metalworking Outlook

Heat Wave Brings Trials, Triumphs

The weatherman predicts temperatures above normal through mid-July, particularly east of the Mississippi and north of the Ohio rivers. The heat wave has already overtaxed New York and Chicago power systems as air conditioners came on full blast at a time when utilities were plagued with mechanical troubles. But makers of air conditioners like the weather. Sales of window units should hit a record this year, surpassing the 1.6 million mark set in 1956.

High Court Rules on Picketing

Two Supreme Court decisions may have far reaching effects on labor-management relations. The justices give the states "wide discretion" in prohibiting picketing. They admit that state courts or legislatures can't place a blanket ban on all picketing, but they rule that states have police power to prohibit the practice in many specific cases if a ban seems proper after a study of the way it is conducted and its purposes.

More Strength for Arbitration Process?

The second High Court ruling should give new punch to the arbitration process. The justices decree that federal courts can enforce agreements to arbitrate future disputes in industries affecting interstate commerce. In several legal battles, lower courts have differed on whether management and unions had to arbitrate despite an arbitration clause in the contract. However, ambiguities still exist. Some state arbitration laws conflict, and the Supreme Court decision deals only with the enforcement of agreements to arbitrate. It says nothing specific about what to do if parties agree to arbitrate but fail to agree on conditions of arbitration, such as the choice of arbitrator.

The Steel Merger Case

Counsel for Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. have until Sept. 16 to answer the government's 103-page argument against the merger of the two firms. Following the exchange of briefs in October, attorneys for both sides will argue the case on Nov. 4 before Judge Edward Weinfeld in the New York federal court. The judge will probably rule by December. The government argument is based on regional and national statistical breakdowns of various product capacities to show how Bethlehem would gain through the merger. The companies contend that the controversy can't be judged "on the basis of the selected statistical material divorced from its business and economic context."

When the U.S. Opposes Marriage

The U.S. has challenged 29 business mergers since 1951. A study of them indicates that the government is most likely to intervene when: The acquir-

ing company's sales exceed $10 million or its assets $50 million; the combined share of the market controlled by the two companies exceeds 15 per cent; a high portion of the production or services in question is already concentrated in relatively few companies.

Auto Replacement Part Sales Up

Automotive replacement part sales in '57 will set another record, surpassing by 14 per cent the previous high achieved last year. So predicts the Automotive Parts Manufacturers Association, but it points out that physical volume per vehicle will be down about 3.5 per cent from 1956 and total physical volume up only about 1 per cent. In 1958, it's probable that physical volume per vehicle will be above 1957's and almost equal to 1956's. Total physical volume should be up about 10 per cent from 1956's. Dollar sales next year should be about 23 per cent above 1956's, if prices hold.

Recovery in Radio

Look for home radio sales to hit 10 million this year. That's not a record, but it's double the 5-million bottom reached only seven years ago. Radio's recovery from television's blow has been caused mainly by a concentration of production in table, clock and portable models.

Small Business and Atomic Power

Nuclear electric generating capacity in this country could reach 227 million kw by 1980 and result in sales of more than $27 billion in atomic energy equipment for industrial purposes. The Small Business Administration says atomic power gives small business opportunities in the components, materials and services related to reactor construction and operation.

Reds May Launch First Satellite

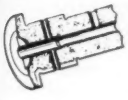
Watch for the Soviet Union to beat the U.S. by as much as a year in the race to fire the first earth satellite. Some American observers think the Reds may be ready to launch their unit as early as next month. Launching of the U.S. satellite was first set for next September, but has now been scheduled "before the end of 1958."

Straws in the Wind

Railroad freight car backlogs fell to 97,006 on June 1, the first time since Nov. 1, 1955, that they have slipped below 100,000 . . . Factory production of transistors in April hit 1.8 million units, up 113.2 per cent from April, 1956, but down 6.8 per cent from March, 1957 . . . Allied-Kennecott Titanium Corp., owned by Allied Chemical & Dye Corp. and Kennecott Copper Corp., will build a plant at Wilmington, N. C., to produce for the civilian market in the East . . . Government controls have been lifted on distribution of argon . . . Steelworker President David McDonald has protested to AFL-CIO the boycott by Sheet Metal Workers International Association against sheet metal specialties made by Burt Mfg. Co., Akron; the steel union has represented Burt employees since 1945.

Performance features of TORRINGTON CAM FOLLOWERS

Heavy sectioned outer race to absorb high rolling and shock loads.



Integral stud for cantilever mounting, case-hardened, with tough core for high strength to withstand shock loads.

Easily relubricated at either end or through cross hole in stud. Ends accommodate standard drive grease fittings or plug seals.

Full complement of small diameter rollers for maximum radial capacity and efficient anti-friction performance.

Races precision ground for even load distribution and uniform low end play.

Built to "FOLLOW THROUGH" under high shock loads

Every feature of the Torrington Cam Follower is designed to insure efficient performance and long service life under heavy rolling and shock loads in cam or track follower service.

Precision made throughout, Torrington Cam Followers are available in sizes from ½" to 2¼" OD. Special surface finishes such as chrome and cadmium plate or oxide black can be provided.

Our engineering staff will be glad to work with you in applying these reliable units to your cam-controlled or track-type equipment. You can depend on Torrington Cam Followers to "follow through" on the job because every element is designed for ultimate capacity. *The Torrington Company,* Torrington, Conn.—and South Bend 21, Ind.

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • BALL • NEEDLE ROLLERS • THRUST

Specify Service-Proved Armco ZINCGRIP PAINTGRIP Steel for painted products that must fight rust

It's zinc-protected, workable, ready for paint

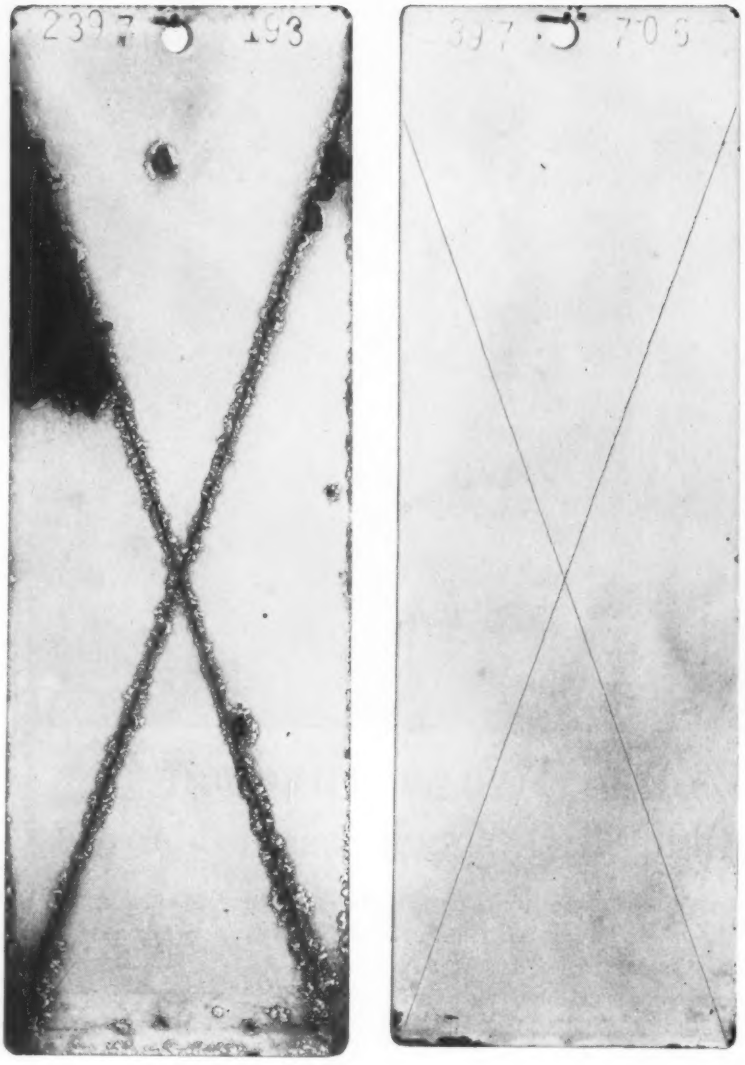
Here's the reason for the 19-year service record of lower manufacturing costs and improved painted products established by Armco ZINCGRIP® PAINTGRIP® Steel:

Since its introduction in 1938, it has offered all the advantages of a workable steel sheet, hot-dip coated with zinc—plus a special mill-Bonderized surface that takes paint immediately, preserves it longer.

Two-step production

1. Form it or draw it. 2. Paint it. The special zinc coating under the mill-Bonderized surface on Armco ZINCGRIP PAINTGRIP flows with the base metal during fabrication. It doesn't flake or peel. Finished products have a smooth, attractive paint finish that lasts longer because paint is completely insulated from the drying action of the zinc coating.

Perhaps Armco ZINCGRIP PAINTGRIP Steel can help you push sales up, hold costs down. Write us today, or call your nearby Armco Sales Office for complete information about this service-proved special steel for painted products.



Here's evidence of the paint-holding qualities of Armco ZINCGRIP PAINTGRIP. Both samples were painted, scratched, and exposed to weather for 18 months. Paint blistered and peeled from the ordinary galvanized steel sample (left). Paint is still held tight by Armco ZINCGRIP PAINTGRIP (right).

ARMCO STEEL CORPORATION

1647 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Repair Your Profits

Although their sales volume continues to climb, participants in this magazine's midyear survey of business expectations report deteriorating earnings are their No. 1 concern. Caught between rising wage and material costs and stiff price competition, they predict their second half profits will drop to 4.6 per cent of sales, compared with 5 per cent in the second half of 1956.

Metalworking managers find the problem frustrating. They say they can do nothing about spiraling wage and material costs. While they continue to seek and obtain greater operating efficiency through more productive equipment, they complain that wages and other costs are advancing faster than their technological progress. They are hesitating to raise selling prices to compensate fully for the higher costs.

So they face the prospect of inadequate profits during a period of record sales, a situation that benefits no one. Samuel Gompers used to say: "The worst crime against the working people is a company which fails to operate at a profit." Failing to make an adequate profit is equally harmful to the customers, to investors and to the public.

Roger Blough, U.S. Steel chairman, defines an adequate profit this way: "It must be large enough to cover the inflated cost of replacing existing facilities and protecting existing jobs. It must be large enough to provide or attract the capital necessary to expand production and create new jobs, new products and new sales. Finally, it must provide a dividend large enough to pay the shareholders a fair return, or rental, on the tools and facilities which they already have supplied to the workers."

While corporate profits are a rather small element in our economy (they have averaged only 5.3 per cent of the gross national product the last five years), they are essential to the present and future well-being of the economy—not to mention the individual company, its management and employees. How else can we provide the tools and facilities to produce the goods for tomorrow?

While there is no handy solution to the declining profit problem, metalworking managers taking part in STEEL's survey offer some suggestions:

1. Keep costs as low as possible through the use of the most efficient equipment and methods possible.
2. Know your true costs and encourage your competitors to know theirs.
3. Sell quality, service and engineering before price.
4. When wage and material costs rise sharply to threaten your profit margin, make your price adjustments promptly. Don't wait. Don't be timid.

You're in business to make money. If your profits are too low, you can't improve your product line or your service. You can't expand. You can't do your share to provide the goods and services the country is going to need.

Walter J Campbell

EDITOR

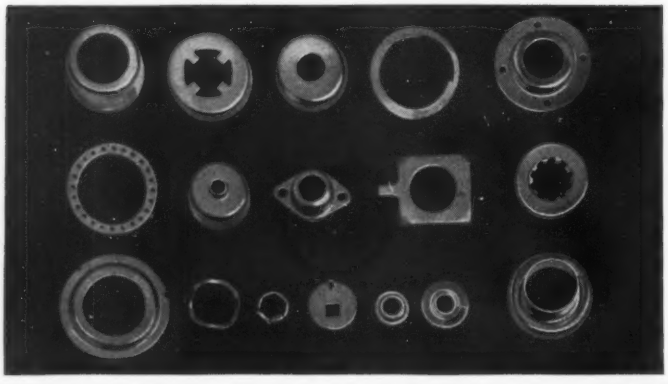
100,000 Washer Dies at Your Disposal

In the purchase of special washers to meet your specific requirements, an important item of initial expense is *die cost.* In addition, the time factor that enters into the designing and building of special dies to conform to your blue prints can prove costly in terms of curtailed production of the equipment on which the washers are to be used.

Here at our Milwaukee Wrot Washer Plant we have available what we honestly believe to be the world's largest inventory of Washer Dies . . . *more than 100,000 different* dies covering almost every conceivable type of washer. These dies, accumulated over a period of 68 years, are at your disposal *without cost* . . . ready for immediate production of washers in all classifications covered by this methodically indexed die inventory.

Whether you are in need of Standard or Special Washers . . . any type, any size, any material . . . consider Wrought Washer Mfg. Co. your No. 1 Source. We can also take care of your requirements for all kinds of stampings.

Let us quote on your washer and stamping needs. *Write for New Catalog No. 40.*



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THE WORLD'S LARGEST PRODUCER OF WASHERS

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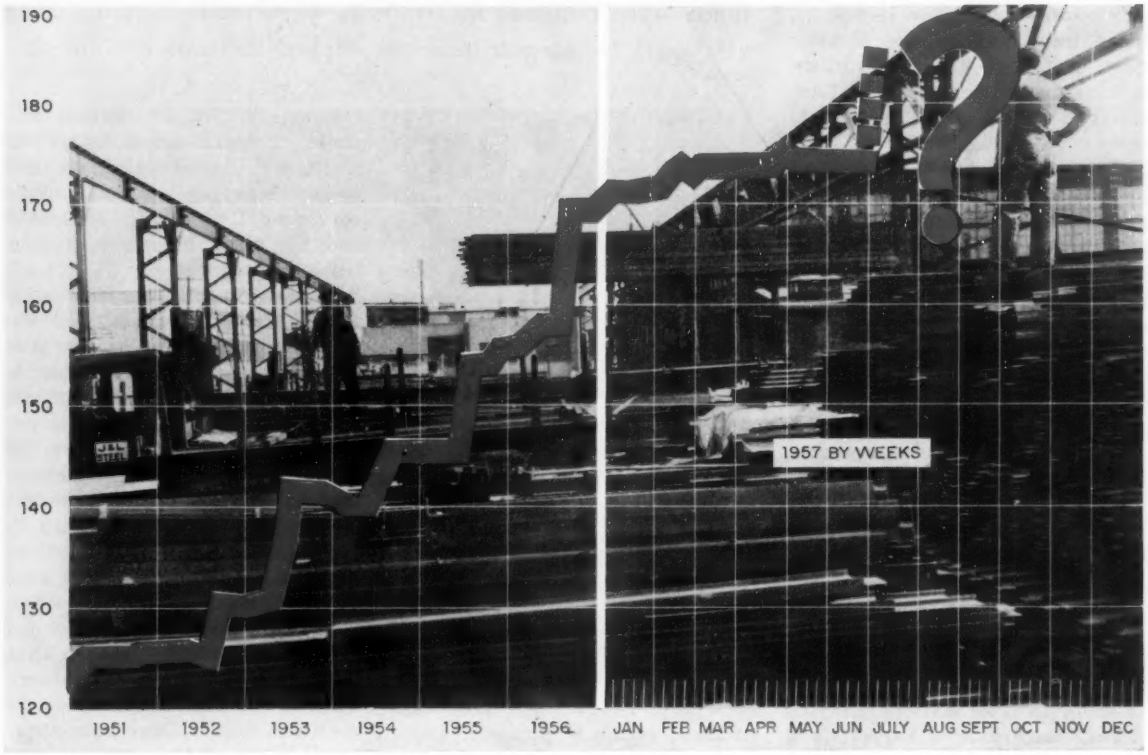
Finished Steel Price Index

(Bureau of Labor Statistics)

(1947-1949 = 100)



Steel Price Hike Coming

The best bet is that it will average $5 to $6 a ton and become effective July 1. That's when the industry's wage costs will rise 17.1 cents per man per hour

TAKE a number from 5 to 10, and you'll be in the contest. The object is to guess the average price increase on a ton of steel after steelworkers get their automatic raise on July 1.

Most bets are on $5 to $6.

Keeping Mum—The answer will come from U.S. Steel Corp. As the nation's largest producer of steel, it sets the price pace—but it's not tipping its hand. U.S. Steel knows how much it would have to raise prices to cover the coming increase in employment cost. The rates of increase were spelled out in the three-year contract it signed last July. Not so certain, though, is the amount of inflation the wage increase would transfer to the material the company buys. There is a rule of thumb to go by: Every cent of wage increase adds another cent to the cost of the things you buy.

Hard To Gage—Even more difficult to appraise is the consumer and public reaction to a price hike.

Such imponderables are causing policymakers to question whether they can pass along the full costs of employment increases. The question is: "How much?" U.S. Steel will probably wait as long as it can to make this weighty decision.

Today's Limit?—Many observers think present conditions will permit an average markup of $5 to $6.

That sum would not cover additional costs growing out of the July 1 employment cost hike.

Formula—Leading steelmakers figure that each cent of wage increase boosts steelmaking costs 60 cents a ton, including direct wage costs and the costs of goods and services purchased. It is believed that the rise in wages will cost steelmakers around 17.1 cents an hour. That means production costs would go up $10.26 a ton.

STEEL calculates that the 17.1 cents is made up like this: 8.7 in employment costs resulting from the hourly increase of 7.0 cents;

1.7 on increments; 0.4 in holiday pay; 2.3 for Sunday premium; and 4.0 in cost of living.

Helping to run up the cost of labor is the cost of living adjustment in the three year wage pact. The government's May 15 cost of living index was believed to have risen enough to give steelworkers a 4 cent an hour increase. Last January, they received an adjustment of 3 cents an hour.

Brakes—Here are the restraints on price increases: This year's July 1 rise in employment costs is a little less than last year's. Demand for steel is lighter, and this makes some consumers, particularly those experiencing a profit squeeze, think steel prices shouldn't rise much. Steel producers' earnings, notably those of the largest companies, were higher in the first quarter of 1957 than in the comparable period of 1956. The steel companies, especially U.S. Steel, are under pressure from the public, consumers and government officials to help restrain inflation.

Most observers expect the price increase to be effective July 1. They reason that it would be easier to tie wages and prices together than to bring up price matters later.

On Base Prices — Expectations are for the price increase to be made on base prices rather than extras. A round of increases on extras ended only a couple of months ago. It was a sequel to last summer's average increase of $8.50 a ton on base prices.

It's likely that increases will vary from product to product, just as they did last August. Some people believe there will be no increase in pig iron prices. They went up $2 a ton in March.

McLouth Plans Expansion

McLouth Steel Corp., Detroit, will undertake a $35 million expansion program at its Trenton, Mich., plant. M. A. Cudlip, president and treasurer, says the program includes a dock extension, ore storage yard, another blast furnace and a sintering plant.

The facilities are scheduled to go into operation by late 1958. McLouth's annual rated ingot capacity will be increased by about 250,000 tons. Present annual capacity is 1.3 million tons.

Steelworkers Face Probe

McClellan committee will investigate Rarick charges that funds were misused, that threats were made in the recent election. Nothing to conceal, replies the union

Donald C. Rarick

THE RARICK REBELLION in the United Steelworkers of America (AFL-CIO) may not be over despite Dave McDonald's re-election as president. Don Rarick (STEEL, Feb. 11, p. 64) was the protest candidate for the office.

Sen. John L. McClellan (Dem., Ark.) announced that his committee would investigate the steelworkers on three counts: 1. That union officials used union funds for personal expenses. 2. That Rarick supporters were threatened with violence. 3. That Mr. McDonald used union funds to gain re-election. Mr. Rarick made those charges before closed hearings of the Senate committee.

Welcome Probe — Said Vincent Sweeney, union public relations director: "Dave (McDonald) told Senator McClellan that the steelworkers will welcome an investigation since we have nothing to hide."

Said a management official who is close to the situation: "I do not believe any of these charges will stick. I think an investigation would be a good thing for the steelworkers psychologically, but, so far as I know, Mr. McDonald and the union are clean from a legal point of view."

Protest—In an interview with STEEL, Mr. Rarick confirmed the charges listed by the senator and added that he also had evidence that some ballots cast for him had not been counted.

Robert T. "Bud" Richardson, of Local 1014, Gary, Ind., told STEEL that he had been followed several times by four men who "tried to get me in a position to give me the business." He said he was also told: "Something might happen to your wife and kids."

Mr. Richardson claims that threatening telephone calls were made to him and other supporters of Mr. Rarick. "These calls came at all hours of the night and are still going on."

Support—Mr. Rarick said that he was convinced that a majority of the union rank and file was behind him in his protest of "the undemocratic way" union dues were raised $2 last fall.

"We went to the McClellan committee because we do not have the money to push our fight against the well - financed international headquarters," he said. "However, we plan an organization meeting of the Dues Protest Committee soon."

Basic Inc. Expands in Midwest

Basic Inc. opened its new $500,000 distribution center at Hammond, Ind. It will supply basic grain refractories to steel furnaces in the Chicago district and serve as district sales headquarters for industrial products.

Expansion work under way at the company's Bettsville, O., laboratories will be completed later this year.

E. W. Bliss Turns Contractor

Manufacturer of rolling mills, canmaking machinery and stamping presses will build and equip complete plants. It also will put in a line to roll strip from powder

THE COMPLETION of a new mill for Jones & Laughlin Steel Corp. in Cleveland will mark the beginning of a new service concept by E. W. Bliss Co., Canton, O.

Bliss calls it a "turnkey" service. The company is acting as contracting engineer for the $18 million job—foundations, the plant itself, mills and mill accessories. Much of the equipment was built by Bliss; some of it was contracted for; and other items were bought. J&L simply has to "turn the key" and begin operation.

Need—Robert Potter, president of Bliss, explains why his firm found it necessary to inaugurate such a service: "Between product diversification and expansion, many firms are moving into unfamiliar areas.

"One of our customers bought a complete cold rolling department so it could gain control over the sheet metal it uses in its stamping shop."

Know-How — The engineering skill, experience and knowledge of their own machinery qualify equipment builders, such as Bliss, to design and build a plant which can use its equipment efficiently and economically, Mr. Potter declares.

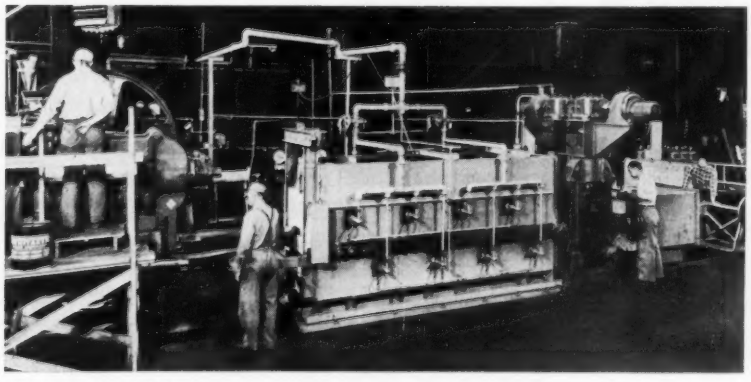
Bliss is offering its turnkey service in three areas—rolling mills, stamping presses and canmaking machinery. The service is complete. It provides an initial study to determine what a customer can expect to save by operating his own plant, how much his investment will be, how soon he can expect it back, the machinery he will need to produce the number of pieces he needs, the labor force required to run the machines and the amount of plant space required.

Sintered Strip—Bliss has just announced it is ready to build and equip a plant to roll strip, tubing and other shapes directly from metal powder. The process costs 80 per cent less than conventional techniques of rolling from cakes or ingots, the company claims.

On a pilot line at the Rolling Mill Division in Salem, O., Bliss has rolled copper, brass, nickel and titanium strip. It also is possible to roll other metals, says George Perrault Jr., vice president and general manager at Salem.

Copper—The 80 per cent saving in rolling costs is based on copper strip. Chemetals Corp., New York, holds the license rights on a chemical process to convert copper cements, scrap and low-yield ores to powder. Bliss has a 20 per cent interest in Chemetals.

In converting scrap to powder, the recovery of by-products—zinc, tin, lead and some nickel—defrays the cost of the conversion and adds to the economy of the process, claims Mr. Perrault.



Pilot line for rolling strip from powder at Rolling Mill Division of E. W. Bliss Co., Salem, O. Metal powder feeds from hopper (top left) through compacting rolls, then through a sintering furnace and the hot mill rolls

Carpenter Bids

Specialty steel producer offers to take over the bankrupt Northeastern Steel Corp.

CARPENTER Steel Co., Reading, Pa., would take over plant facilities of the bankrupt Northeastern Steel Corp., Bridgeport, Conn., under the reorganization plan proposed by court-appointed trustees of Northeastern.

Carpenter would exchange 40,000 to 65,000 shares of its common stock (valued at $70 a share) for a new issue of Northeastern stock.

Hearing Set—The proposal will be heard by Federal Judge Robert P. Anderson at New Haven, Conn., starting July 8.

Trustees J. William Hope and Richard J. Smith of Fairfield, Conn., say the plan "insures the continuation of Northeastern Steel Corp. in Bridgeport."

At Reading, John Moxon, executive vice president of Carpenter, said: "If the court approves the reorganization plan, we will have to spend about $5 million the first year. It will take at least $2 million to tidy up the plant and get Northeastern started under our operation."

Capacity—Northeastern's equipment includes two electric furnaces (installed in 1955) with a combined annual rated capacity of 114,912 net tons. There are three (one 120-ton and two 60-ton) open hearth furnaces with a combined capacity of 188,280 net tons a year.

A bloom and billet mill, combination mill, strip mill and cold drawing and stainless wire facilities make up the rest of the plant.

History — Northeastern Steel Corp. was organized Dec. 17, 1954, and two weeks later bought the steel plant and property from the Stanley Works.

Since its formation, Northeastern has lost some $4 million.

Motivating Men To Produce More

Management finds that boosting factory productivity is as difficult as lowering a golf score. Both require better supervision, an improved attitude and some sort of incentive

NEEDED: Greater productivity.

That was the consensus of delegates to the National Metal Trades Association's plant management conference at Lake Delton, Wis.

Outpaced—While productivity rose by an average of 3.5 per cent annually from 1947 to 1956, employment costs during the period increased by about 5 per cent each year. Adding to management alarm is the fact that productivity rose scarcely at all in 1956.

What can be done? One answer: Motivate men to produce more. A panel discussed three aspects of the problem—supervision, employee attitudes and wage incentives. Supervision was the subject for James Zamrazil Jr., manager of industrial relations at Clayton, Mark & Co., Evanston, Ill., maker of tubing and well specialties. Employee attitudes were discussed by Willard E. Erickson, director of the attitude survey project at the University of Chicago's Industrial Relations Center. Fred A. Gahl dealt with wage incentives. He's chief plant and industrial engineer at Bell & Howell Co., Chicago producer of movie projectors and related equipment.

Conclusions—Improved supervision is probably the most important factor in motivating workers to produce more. But no one aspect of the problem can do the whole job. Money plays a unique role in motivation. It's central and basic, but it's usually taken for granted. In one employee survey, it ranked eighth among a list of the ten most important motivations. Yet, let wages fall below the competition's level and money will jump to the first spot.

One other central conclusion by the panel: Your employees don't necessarily have to be happy to produce more, but happiness does no harm in spurring greater production. For specific conclusions in each of the three areas, see the following three columns.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Building, Cleveland 13, Ohio.*

with BETTER SUPERVISION

WHAT makes for successful leadership? James Zamrazil gives three answers:

1. A leader who makes his group cohesive and who helps it achieve specific goals.
2. A leader who is goal-centered, emotionally spontaneous, well organized, tactful, productive and possessed of insight.
3. A leader who has method—delegates authority, concentrates on training and devotes himself to the job of leadership, not production.

Why do men work? Mr. Zamrazil points out that the successful supervisor must know the answer to that question. These five reasons stand out:

1. To satisfy physiological needs—to be active, to have a certain routine, to eat.
2. To achieve safety and security—a job must be as safe as possible and as secure as practical.
3. To meet a desire to belong—most people tend to work better in groups than alone.
4. To achieve a good status and the esteem of fellow employees—praise is generally more helpful than criticism.
5. To get self-realization or self-expression—the job should do some good, have some value.

The five factors are arranged in order of ascending difficulty. The first two are relatively simple. The supervisor should watch that hours are fairly regular, that the routine is sufficient but not too onerous, that safety is practiced, that job assignments, transfers and promotions are made fairly. The next three are the real tests for a supervisor. They are factors that can dramatically improve productivity.

2 with BETTER ATTITUDES

CAN something as intangible as man's attitude be measured? Yes, says Willard Erickson.

That question posed to manufacturing companies by the University of Chicago showed a 100 per cent affirmative.

Is an employee's attitude important? Some 90 per cent said, yes.

Is an attitude survey worthwhile? Some 87 per cent replied, yes.

Does an attitude survey improve people? Some 66 per cent said, yes.

The university's studies show these to be the five most important feelings and attitudes toward a job:

1. Employees want to be proud of their company and management.
2. They want to feel that the immediate supervision is competent.
3. They want material rewards, but this is the least important of the five if wages are competitive.
4. They want congenial fellow employees.
5. They want the job to be interesting and fun.

How can you improve man's attitude? Mr. Erickson say these are the six most commonly used methods:

1. Improve communications to show that the company and its management are worthy of working for.
2. Eliminate company bottlenecks. Most employees get as irritated as management does at poor departments, incompetent foremen, bad work.
3. Train supervisors more thoroughly.
4. Develop job descriptions. Most men like to know their job boundaries.
5. Improve the physical environment—the lighting, plant cleanliness, locker room facilities, parking space.
6. Improve discipline. Most people welcome reasonable rules reasonably enforced.

3 with WAGE INCENTIVES

WAGE incentives are added earnings for added effort that brings added output, says Fred Gahl.

He says that incentives installed at a Bell & Howell stenographic department made it possible for 11 stenographers to do the same work that 18 once did. B&H finds that employees not on incentives work at only 45 per cent of efficiency. But an incentive worker, on the average, goes at 120 per cent of the standard. Indirect labor may work at only 33 per cent of the standard if not on incentives.

Some 60 per cent of the company's 4000 employees participate in some form of wage incentives because B&H believes the program helps:

1. Meet competition.
2. Upgrade people.
3. Retain good workers with higher earnings.

The average B&H employee on incentives earns an additional 25 per cent of his base pay a year, or about $700 annually. That's not counting the Christmas bonus or profit sharing.

The company has had incentives since 1936, but until 1950 the program was a relatively crude stop watch system. In 1950 it set up work standards by:

1. Establishing the best method of doing the job.
2. Training the employee in that method.
3. Then, measuring the time.

B&H has discovered these prerequisites for a successful system:

1. It must be fair.
2. It must pay in direct ratio to effort.
3. It must be simple and easily understood by employees.

Wage incentives are no substitute for poor supervision. They're a supplemental setup that must be continually watched and maintained.

Square D Co.

Motor Controls Hold Steady

Automation demands are boosting sales, but a stretch-out in metalworking expansion programs may keep them from bettering last year's estimated $500 million plus

SHIPMENTS of motor controls are matching last year's brisk pace, but new orders are falling behind. Backlogs are being whittled.

Sales to some industries are up; others are off — some sharply. While the industry's new orders are down 5 to 10 per cent so far this year, companies find their sales picture affected more by the type of customer they serve than by the industry which they are in.

Ups and Downs—Furnas Electric Co., Batavia, Ill., expects its sales this year will be 25 per cent higher than last year's. It notes the air conditioning industry has increased its volume of orders substantially in the last year.

H. E. Beane, vice president, Bristol Co., Waterbury, Conn., says sales are running 47 per cent ahead of 1956's. Responsible for the change, he says, are the chemical, oil and public utility industries.

Orders from mining industries are up, while railroads and communications are down, reports Adams & Westlake Co., Elkhart, Ind. It expects sales will be slightly ahead of last year's.

A manufacturer in the Midwest thinks his sales will be down 15 per cent. He finds steel and general industrial ordering are down.

Electric Controller & Mfg. Co., a division of Square D Co., Cleveland, attributes the slowdown in new orders to a stretch-out of expansion programs in the aluminum and other basic metal industries. Increasing orders are coming from air conditioning (sparked by a trend to larger equipment), the oil industry and cement mills.

Allen-Bradley Co., Milwaukee, thinks new order totals for this year may be a little less than last year's. Another manufacturer looks for about a 4 per cent drop. He says construction, appliance and machine tool orders are down, but steel orders have held up.

Paul B. Wishart, president, Minneapolis-Honeywell Regulator Co., Minneapolis, says sales of industrial controls are running 25 to 30 per cent ahead of last year's, but he notes that the uptrend seems to have leveled off during the last few months.

Up and down characterizes Reliance Electric & Engineering Co.'s analysis of the motor control market. Standard items and orders from the auto industry are down. Controlled drives for auto-

mation applications are a little above the firm's 1956 mark.

Automation—The trend to automation, says Reliance, is bringing more sales and making controls more complex. Clark Controller Co., Cleveland, says the trend is to combining operations into systems or processes.

Westinghouse Electric Corp.'s Motor & Control Division, Buffalo, says the 1957 sales outlook is bright, and indications are that orders for automation equipment are increasing faster than those for the standard variety.

What's New — Technical developments are affecting sales. One important factor is the use of static switching circuits to replace relay systems. Card-programmed rolling operations are getting a lot of attention from steel and aluminum mills. Also important to sales, says D. B. Sinclair, vice president, General Radio Co., Cambridge, Mass., are developments in guided missiles.

Other sales boosters, says Bristol Co., are new processes in the chemical and oil industries.

Ouch — Most manufacturers expect that it will be necessary to pass on material costs and higher wages to the customer. Two flatly predict a price hike of 10 per cent.

Superior Tube Expands Plant

Superior Tube Co. will spend $2 million for an office building and an addition to its main plant at Norristown, Pa. The project is part of a $5-million expansion program which began last year. It is scheduled for completion in 1958. It will provide space to consolidate and simplify production lines and to house increased engineering, laboratory and office personnel.

Superior and its affiliated companies make small diameter metal tubing; cathodes for electronic tubes; cold drawn bars; tubular, stamped and deep drawn parts for the electronics industry; subassemblies and components for nuclear power reactors; aperture masks for color television picture tubes; special machinery; and machined parts and subassemblies for the automotive, aircraft, electrical and electronics industries.

Mill Suppliers Study Market

Industrial supply and equipment manufacturers and distributors seek modern, more efficient management methods to build up service and hold down costs

AS A USER of industrial supplies and equipment, you can look for more efficient and economical service from your local distributors.

Both distributors and manufacturers of such items as small tools, transmission equipment, hacksaw blades, grinding wheels and wire rope are going all out to apply modern marketing and management methods.

First Hand — Meeting at San Francisco, members of the National Industrial Distributors Association, the Southern Industrial Distributors Association and the American Supply & Machinery Manufacturers Association received first-hand progress reports.

ASMMA's new distribution analysis survey reveals shifts in markets for industrial supplies. California is in top position, replacing New York, which is second. Ohio and Illinois follow closely in third and fourth places.

Hunt Costs—A six-month study of management methods and operating procedures is being sponsored by the two distributor groups. Its purpose: The uncovering of practices that inflate distribution costs and reduce efficiency.

Some distributors are using punch card systems to save on paper work, increase turnover and keep inventories in better balance. Others have set up technical service staffs to help customers find solutions to production problems.

Better Service—New data on value added by distribution show customers often can get better service at lower cost through distributors than through manufacturers.

A management course for industrial distributors has been established at the Harvard Graduate School by the distributor groups. They also are supporting engineering courses with a major in industrial distribution at Clarkson College, Western Michigan, Bradley University and Texas A&M.

Clarkson will graduate its first students of industrial distribution next year.

How's Business? — Incoming ASMMA President Robert L. Hamilton (president of Dumore Co., Racine, Wis.) told STEEL that orders are coming in at a healthy rate at a time when manufacturers normally should expect a summer slump.

The ASMMA new order index has been declining from its record peak of 221 in January but it still is well above 1956 and 1955 levels. Mr. Hamilton said tight money caused a slowness in accounts receivable in March, but that situation now is relieved. Tight money also has caused a reappraisal of inventories and clearing of obsolete items.

Other Officers — Other new ASMMA officers are: First vice president, Lyman H. Bellows, Sheldon Machine Co., Chicago; second vice president, Fred C. Emerson, Spartan Saw Works Inc., Springfield, Mass.; secretary, Frank J. O'Laughlin, Commander Mfg. Co., Chicago; and treasurer, Paul A. Johnson Jr., Dake Corp., Grand Haven, Mich.

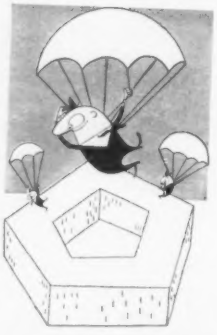
New president of the southern group is A. V. Davies, Moore-Handley Hardware Co., Birmingham; first vice president, H. B. Tonsmeire, Turner Supply Co., Mobile, Ala.; and second vice president, W. P. Marshall Jr., Marshall Supply & Equipment Co., Tulsa, Okla.

Verdict: Not Guilty

A Denver U.S. District Court jury found Union Carbide Corp. and Vanadium Corp. of America not guilty of Department of Justice charges.

The department had charged that the two corporations conspired to monopolize the vanadium industry and fix prices between 1933 and 1946.

Costs To Be Cut; Industry Aid Asked



THE "CLASSIFIED" sign was hung out last week as key aviation industry executives flew into Washington for a briefing on rising costs and management problems in Air Force development and production programs.

Guesstimating—Observers think the conference covered two principal points: 1. Changes in missile development. 2. The coming aircraft slowdown. Under heavy pressure from Capitol Hill to cut costs, the AF now wants to line up its missile programming through 1962 at least. This means, possibly, that some missiles still in the earlier development stages will be dropped, and newly available funds will be turned to other missiles which are closer to the production stage.

The situation is analogous to your new product development problems. At some point you have to stop spending money on six potentially good products and concentrate on the ones which you feel will pay off in the shortest possible time.

Col. Charles L. Monroe Jr. of the Air Materiel Command puts the basic problem in missile utilization this way: If you want to know how many missiles are needed to destroy a country's ability to make war, then take its number of industrial areas and multiply by 1.25. Because just a little better than one missile per target area is needed, it's easy enough to see, says another AF spokesman, that we don't have to keep up our tremendous expenditures on missiles past another five years. Colonel Monroe likens our new approach to missiles to a laboratory job rather than a mass production one.

Who's Hurt—Obviously, even some of the missile makers and electronics firms are in for trouble, let alone the airframe manufacturers. That's why the key executives were invited to Washington—to get it from the horse's mouth. (STEEL printed the story of the new AF look over a month ago. See May 20, page 101 and May 27, page 60.)

Small Business Slips

Subcontracting will be drastically reduced in AF programs of the future, believe small business sympathizers. Wendell B. Barnes, small business administrator, is facing the facts. He opposes, as unworkable, a congressional move to require big business to subcontract more defense work to small business.

The Defense department says from July, 1956, through March, 1957, small business' share of the defense potential was 57.6 per cent, off sharply from the 63.8 per cent it got in fiscal 1956, the 69.4 per cent in fiscal 1955 and the 74.4 per cent in fiscal 1954. The small business share of prime contracts is down to 16.9 per cent, compared with 19.6 per cent in fiscal 1956, 21.5 per cent in fiscal 1955 and 25.3 per cent in fiscal 1954.

WOCs Will Leave Town?

Ten executives on loan to the Business & Defense Services Administration as heads of the industry division may be on their way out.

It's the result of congressional dislike for the WOC program. The story goes: When the BDSA appropriation came up for approval by a joint committee of the House and Senate, BDSA had to agree to phase out the WOC program to get $2.1 million back from the House cut of $3.5 million. Permanent government personnel will head up the division soon; and not much later there'll be no more WOCs.

Concentration Will Be Charged

In another week or so, Sen. Estes Kefauver's (Dem., Tenn.) Antitrust & Monopoly Subcommittee will release a report charging undue concentration in such industries as oil, steel and autos. Sen. John Sparkman's (Dem., Ala.) Small Business Committee will conduct hearings on concentration in the trucking industry the first week in July.

The two senators, of course, have the Supreme Court decision on the Du Pont-General Motors case in their favor.

Slight Snafu in Tool Leases

Defense Mobilizer Gordon Gray has signed an order calling for uniform rental rates on government machine tools and other production equipment. They are a little higher than those proposed by the interagency task force which was set up to recommend new rates. In fact, Mr. Gray has not seen fit to carry out the full task force program (STEEL, May 13, p. 75).

Rates are 1.75 per cent of acquisition cost per month for tools up to two years old; 1.50 per cent for tools two to six years old; 1.00 per cent for tools six to ten years old; 0.75 per cent for tools over ten years old. Rates are uniform for all tools regardless of the character or extent of use. But exceptions for elephant tools and equipment used in the turbine-gear program probably will be published soon.

Mr. Gray failed to incorporate the task force proposal for a maintenance fund to keep the government tools up to date. Machine tool leaders heartily endorsed the original program; they now feel that the ODM has let them down by going at it piecemeal.

Morgan Quality in Action

MORGAN WORCESTER

High Speed Four Strand Rod Mill

Cuyahoga Works, American Steel and Wire Division

UNITED STATES STEEL CORPORATION

Morgan Mills are known to steel men throughout the world for their sound design and accurate manufacture . . . an enviable reputation which has assured mill users of efficient and trouble-free operation. Morgan Mills have kept pace with the ever-increasing demands for high output and greater accuracy of product.

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ÆSOP'S FABLES No. 7

Once there was a fisherman who enjoyed playing the bagpipes as much as he enjoyed fishing. Upon a balmy Summer day, he seated himself on the river bank and played a series of gay tunes . . . hoping this would attract the fish into jumping right onto the shore. But, nothing happened . . . so, he cast a net into the water and soon drew it out filled with fish. Watching the fish dancing and flapping about in the net, the fisherman shook his head and remarked:

"I will have none of your dancing now . . . since you wouldn't dance when I piped!"

Moral:

'*Tis a great art to do the right thing at the right time.*

. . . and this same "great art" is just what is embodied in famous ADAMANT, *the original high temperature cement* . . . for instance, the bonding strength of ADAMANT *increases* as temperature rises . . . is as strong as the brick it bonds . . . manufactured to perform just right at just the right time!

Designed to withstand extreme temperature differentials, pliable, ready-to-use ADAMANT has proved its versatility for a variety of other uses in maintenance and repair . . . comes ready-mixed in air-tight drums of 100, 250, and 500 lbs. There is more detail in our new Bonding Mortars Bulletin No. 3.

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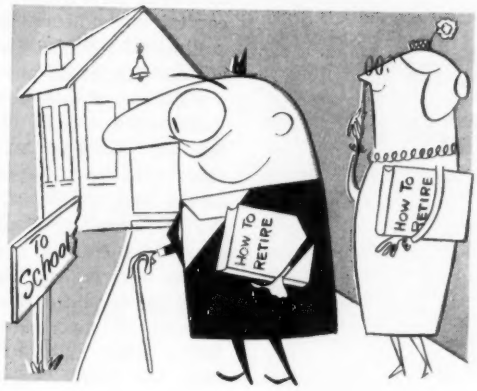


Republic Steel sets up a school to help employees . . .

Plan for Retirement

SAM BROOKS was approaching the retirement age of 65. Although he and Elizabeth, his wife, didn't own their own home, they could count on a monthly income of $100 from social security and pension benefits and savings of $4000. Because they were tired of the cold northern winters, the Brookses decided to move to the South . . .

To find out what happens, you don't have to tune in next week. You need only attend Session No. 10 in Republic Steel Corp.'s preretirement training program. Its topic: "Where To Live When You Retire."

Case History—Seated with you in a classroom at the Human Engineering Institute, Cleveland, are nine Republic employees and their wives. It's 7 p.m., and for the next 90 minutes you're going to discuss the factors involved in choosing a place to live. You'll talk about Sam Brooks, protagonist in one case history, and about Bob Lawson, whose problems were similar. If the discussion serves its purpose, you'll gain an insight which may help you to avoid Sam's misfortune and duplicate Bob's success.

The session described above is typical of the meetings attended each week by about 40 couples. On the first four nights of each week, ten couples meet with a discussion leader to consider one phase of retirement. As presently constituted, "Planning for Later Maturity" is a ten-week course, with this curriculum:

- The Challenge of Later Maturity.
- Nutrition and Health in the Later Years.
- The Physical Side of Aging.
- Mental Health in the Later Years.
- Financial Planning for the Later Years.
- The Meaning of Work and Retirement.
- Getting the Most Out of Leisure.
- Increasing Your Retirement Income.
- Family, Friends and Living Arrangements.
- Where To Live When You Retire.

Success—Since the program was originated in April, 1956, all of Republic's Cleveland area personnel 55 years of age and older have been invited to participate. To date, nearly 400 individuals, representing all divisions and every level, have enrolled. Of the 98 who comprised Group II, enrolled in the fall of 1956, 80 completed the course. In Group III, whose members enrolled last winter, 76 of 100 finished the program.

Those statistics indicate the success of a training project almost without precedent. Conceived in the spring of 1956, the course had the blessing of Chairman C. M. White from the start. He shared the view of J. S. Kopas, training counselor, and H. C. Lumb, legal counsel, that pensions alone could never assure the happiness of retired employees.

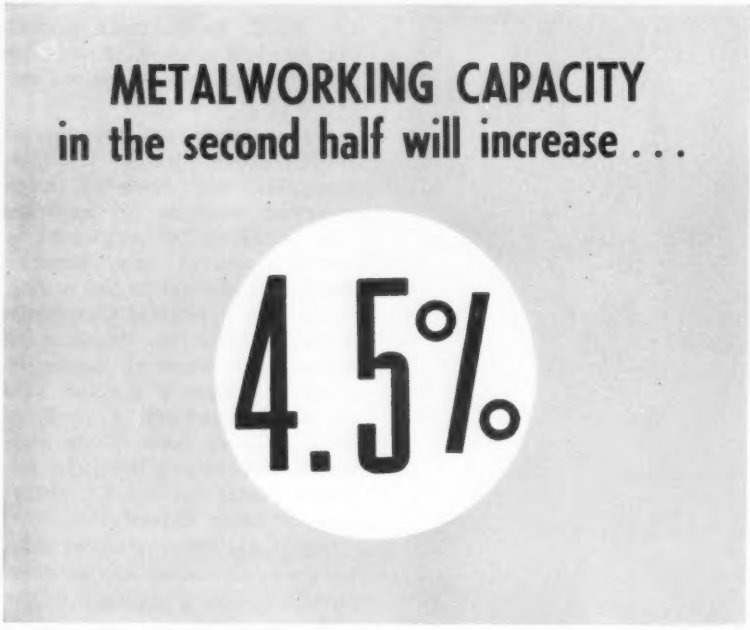
Action—When an investigation by Mr. Lumb revealed that few companies had developed much experience advising or preparing their employees for retirement, it become apparent that Republic would have to chart its own course. To do this, it retained Cleveland's Human Engineering Institute, a nonprofit development center of which Mr. Kopas is director. This organization devised a program based on work done by the University of Chicago's Industrial Relations Center and called it "Planning for Later Maturity."

Using case histories as the basis for group discussion, the program permits a clinical approach to the problems which all participants face. By using skits, it seeks to bring everyone into the act. As Dr. J. C. Nichols, assistant director of the institute, points out, there are no right or wrong answers. And group leaders, drawn mainly from outside the company, are never called "instructors."

No Charge—The entire cost of the project is borne by the company, and employee participation is strictly voluntary. Since Republic does not make retirement mandatory at any age, employees may avail themselves of the program whenever they see fit. Participants have been as young as 55 and as old as 79.

Asked to rate the sessions they had attended on the basis of importance and interest, group members listed "Financial Planning for the Later Years" first; "Where To Live When You Retire" second; and "Nutrition and Health in the Later Years" third. Said one respondent in a postscript to his ratings: "At the beginning of the course I was rather skeptical as to the benefits to be derived. Now at the close I am much benefited and heartily in accord."

Payoff—What's in it for Republic? Better productivity, maybe, if retirement worries of senior employees can be dissipated through education. Mrs. Helen Randall, a discussion leader, views the program as: "Good public relations, good internal relations and good human relations."



STEEL surveyed a cross section of 5000 plants. Results show: Nearly one-third of metalworking will raise the industry's capacity by almost one-twentieth

HERE is what you can expect in the way of plant expansions and additions to equipment during the second half. STEEL surveyed 5000 metalworking plants to get the results.

Rundown: 4.4 per cent say they will build new plants; 13.2 per cent plan additions; and 22.1 per cent expect to install new equipment. (Because of duplication, the figures do not represent the 28.9 per cent planning expansions.)

New Highs—Over-all capital expenditures will hit an annual rate of $37.9 billion during the third quarter, reports the Department of Commerce and the Securities & Exchange Commission, up from the $37.3 billion annual rate established in the second quarter.

Most major manufacturing industries will make higher capital investments the first three quarters of this year than during the same period in 1956, the survey shows. Some samples: Steel companies—up 40 per cent; nonautomotive transportation—up 50 per cent; nonelectrical machinery—up 25 per cent; nonferrous metals producers—up 100 per cent.

Continued Climb — Government officials are confident that total expansion investment for 1957 will reach the $37.4 billion forecast in March (STEEL, Mar. 18, p. 53). That will be 6.5 per cent above the 1956 mark, which was 22.5 per cent over that of 1955.

Rising costs account for about half of the increases, the survey says.

Explanation—Many reasons are given for the activity:

"We are enjoying fine business and anticipate an increase in the last half of 1957 and in 1958. We are expanding accordingly," says one executive.

Another feels: "The continuing decline in our selling price, combined with the anticipated steel increase, leaves our only hope for profits in expanding that part of our business in which steel is not a major part of production cost."

Forced—"Increased wages and salaries and rising costs of raw materials have forced us into large capital expenditures for improved equipment to reduce some of these costs," points out one executive.

Another View—Continuing expansion may not be all to the good, believes William A. McDonnell, chairman, First National Bank, St. Louis, and chairman, U.S. Chamber of Commerce Finance committee. "We are like the driver who starts out on the highway at 50 mph, but soon moves up to 60 mph because 50 mph seems too slow. We've been riding the boom so long we don't realize how fast we're going."

Mr. McDonnell thinks we ought to save some of this vast spending power for a rainy day: "Maybe it's time to level off our increasing rate of growth until our savings can catch up with our spending." He believes that financing long term growth with "anything but savings" is to increase the danger of inflation.

No Gain Needed — This year, capital expenditures are running about 6 per cent ahead of last year's rate. Mr. McDonnell thinks that the economy would be in no danger next year, if our present rate (6.5 per cent over 1956) is not increased. He concludes: "Lots of lines are getting overbuilt."

Mr. McDonnell feels that current rates of interest don't deter capital expenditures. If corporations delay new plant and equipment spending, they find costs increase faster than interest rates. With the 52 per cent corporate tax rate, the current after tax cost of a loan is less than it was in the 1930s, he points out. As a banker, Mr. McDonnell follows his own advice by telling his customers to limit expansion projects as much as possible.

Drop Off?—Dr. Emerson Schmidt, U.S. Chamber of Commerce's research director, thinks Mr. McDonnell's wish may come true next year, at least in new plant expenditures. They may decline, while equipment purchases and modernization continue to go up.

Chemical Industry Will Expand

The American chemical industry anticipates spending $895 million on new plant and equipment during the first half of 1957. The to-

tal for the year will hit $1.8 billion, the Commerce department's Chemical & Rubber Industry Report indicates.

The total is 11 per cent above the mark for the second half of 1956—expenditures amounted to $808 million, or 25 per cent above the outlay in the first half of that year.

Oil Growth To Cost $60 Billion

The oil industry must invest $60 billion in the next five years to meet world demand, Augustus C. Long, chairman, The Texas Co., predicted. Mr. Long said this would be double the rate of the last ten years and that about 50 per cent should be spent abroad.

By 1965, Mr. Long forewarned, domestic consumption will reach about 12.1 million barrels daily, compared with 8.8 million in 1956. He expects consumption abroad to reach 14.6 million barrels daily, in contrast with 6.8 million a day in 1956. He said much of the increased demand would be met by foreign production.

Norton Builds Another Plant

Norton Co., Worcester, Mass., will build a $6.5 million plant for the manufacture of organic bonded grinding wheels. Scheduled for completion in 1959, the facility is designed for straight line production of wheels up to 30 in. in diameter. Much of the new equipment will be designed by the company and built in its own shops.

Borg-Warner Subsidiary Builds

Weston Hydraulics Ltd., a subsidiary of Borg-Warner Corp., will construct a 75,000 sq-ft building at Van Nuys, Calif., for the development and production of hydraulic and pneumatic equipment for aircraft, missiles and rockets. Employment at this multimillion dollar facility is expected to reach 1000. I. E. Weston, president and general manager, indicated that other Borg-Warner divisions and subsidiaries may also build there.

Expenditures on New Plant and Equipment

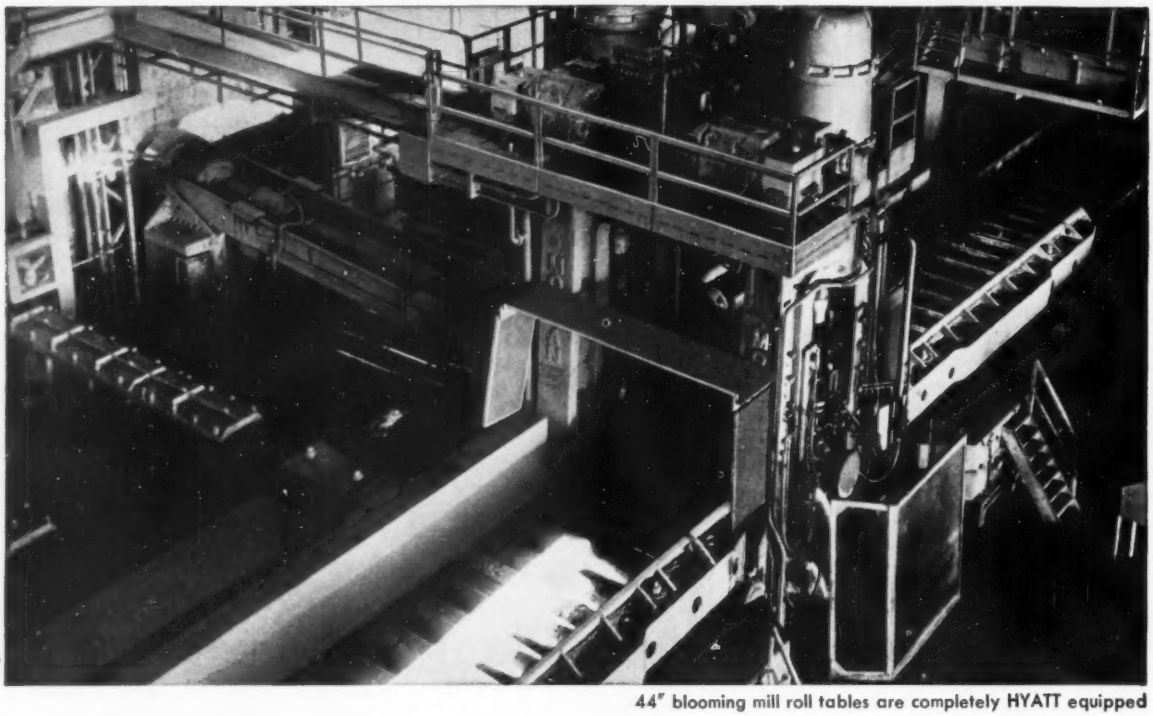
(Millions of dollars)

	1957				
	Jan.-Mar.	Apr.-June	July-Sept.*	1956	1955
Manufacturing	3,505	4,421	4,189	14,954	11,439
Durable Goods Industries	1,759	2,253	2,148	7,623	5,436
Primary iron & steel	327	431	411	1,268	863
Primary nonferrous metals	147	212	268	412	214
Electrical machinery & equipment	126	186	172	603	436
Machinery, except electrical	270	350	328	1,078	809
Motor vehicles & equipment	297	380	326	1,689	1,128
Transportation equipment, excluding motor vehicles	126	169	165	440	274
Stone, clay & glass products	135	164	156	686	498
Other durable goods	331	361	322	1,447	1,214
Nondurable goods industries	1,746	2,168	2,041	7,331	6,003
Food & beverages	201	235	209	799	718
Textile mill products	111	102	82	465	366
Paper & allied products	192	228	209	801	518
Chemicals & allied products	353	444	472	1,455	1,016
Petroleum & coal products	728	976	913	3,135	2,798
Rubber products	46	49	51	201	150
Other nondurable goods	115	134	105	475	437
Mining	300	324	314	1,241	957
Railroads	342	408	404	1,231	923
Transportation, other than rail	358	468	476	1,712	1,602
Public utilities	1,205	1,639	1,788	4,895	4,309
Communications	2,572	2,608	2,451	2,684	1,983
Commercial & others				8,364	7,488
Total	8,282	9,868	9,622	35,081	28,701

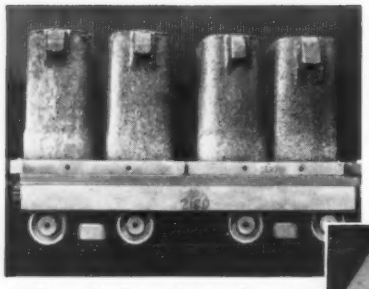
Source: Department of Commerce, Securities & Exchange Commission.
*Estimated.

DETROIT STEEL, PORTSMOUTH DIVISION

Portsmouth, Ohio



44" blooming mill roll tables are completely HYATT equipped



All four-wheel ingot buggies have two HYATT Roller Bearings per journal

Roll tables of the 54" hot strip mill are fully equipped with HYATTS

Another progressive plant that

HANDS THE HEAVY LOADS TO HYATTS!

HYATT Roller Bearings are installed on all open hearth charging box cars

In addition to the key installations pictured above, all mill motors are equipped with HYATTS, too. Like so many other leading steel producers, Detroit Steel Corporation can't afford to depend on anything less than the *best* in roller bearings. *Can you?* Hyatt Bearings Division, General Motors Corporation, Harrison, N.J., Pittsburgh, Detroit, Chicago and Oakland, California.

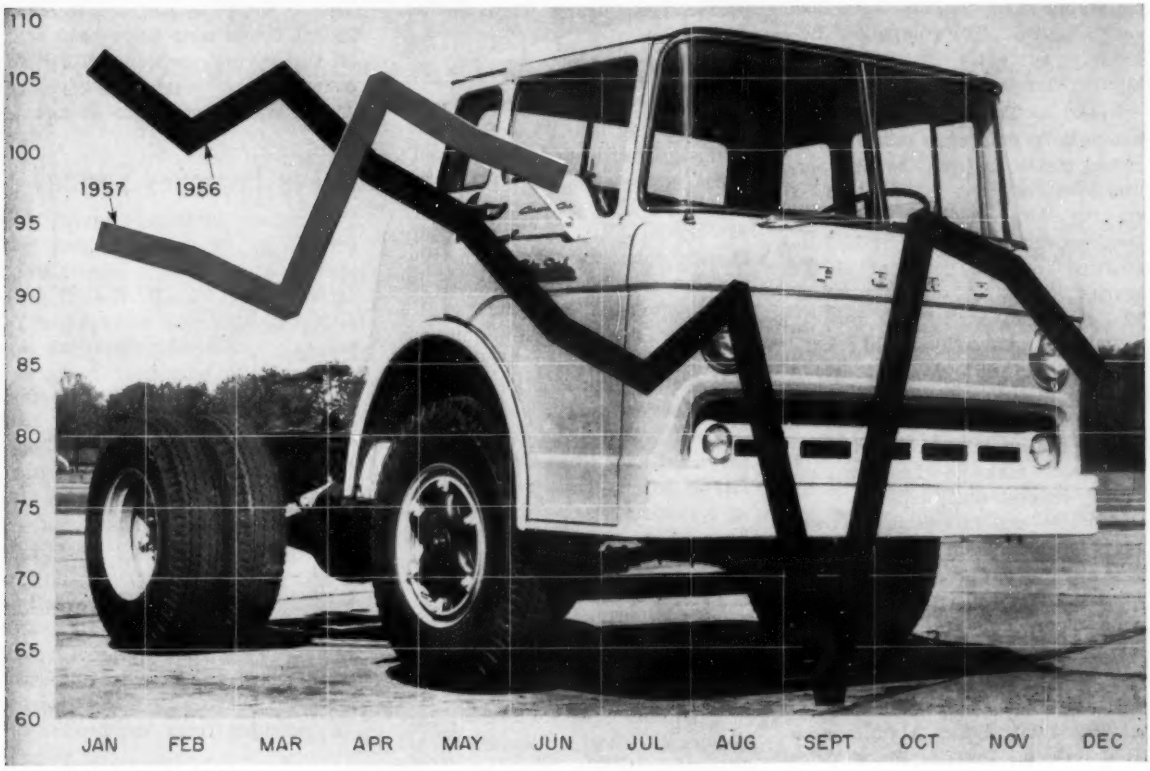
GM GENERAL MOTORS

HYATT *HY-ROLL BEARINGS*

FOR STEEL INDUSTRY

U. S. Truck Production

(In thousands)



Source: Ward's Automotive Reports.

Truck Output on Schedule

Builders see July as make-up month to bring production up to last year's levels. Trend toward heavy duty models sees White Motor Co. bid for lead among independent makers

TRUCK OUTPUT so far this year has been running about 3 per cent behind the 1956 pace. But July looks like a make-up month.

Some 579,548 trucks will be built during the first half of this year, compared with 595,513 in the 1956 period, says *Ward's Automotive Reports.*

Traditional—First quarter output followed traditional patterns for truckmakers although the production dip was not so severe as usual. Quarterly totals were almost the reverse of what they were last year.

With a pickup in July, truck builders should roll out models through the summer. Output usually takes its biggest dip in September or October. Right now there's nothing to indicate manufacturers won't hit the 900,000 mark predicted earlier by Harlow Curtice, GM president.

If present operations continue, 1957 production can equal last year's when 1.1 million trucks were built, but conservative estimates still place the figure at under 1 million.

Leader—Ford has made the biggest gains of all builders this year. It's 15,000 units ahead of 1956. Robert McNamara, vice president and Ford Division general manager, says the company is enjoying a 50 per cent boost in pickup truck sales. Tilt cab trucks also are selling strongly, he adds.

Although *Ward's* indicates Ford, Chevrolet and International Harvester now outpace Dodge, GMC, Divco, Mack and White in unit sales, it doesn't tell the whole story. Dollar sales still favor the heavy duty boys.

Example — White Motor Co., Cleveland, sold 4215 units during the first quarter, compared with 4882 in the first three months of 1956. Production through the first

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half is about 1000 units less than last year at the same time.

But J. N. Bauman, White's president, points out that demand for heavier vehicles has boosted dollar volume $1.3 million above last year's figures. The company's diesel sales currently are 15 per cent higher than 1956's.

Trend — This growth of the heavy duty market is indicated by recent statistics from the Automobile Manufacturers Association. It reports 1956 factory sales of trucks over 14,000 lb (GVW) accounted for 37.5 per cent of the market, compared with 32 per cent the previous year.

Indications are this trend is continuing as the highway program gains impetus. Higher farm incomes mean a sales increase for pickup trucks, but this spurt probably won't make too heavy a dent in the market until 1958.

Shift — An interesting power shift is shaping up as heavy duty sales soar. Motordom feels White is climbing toward the top among independent builders.

Its most recent acquisition (last month) is Reo Motors Inc. The Lansing, Mich., subsidiary was bought from Bohn Aluminum & Brass Corp., Detroit, for a price reported to be near $4 million.

Aim—Diamond T Motor Car Co., Chicago, appears to be White's next target. Bohn also owns more than 137,000 shares of Diamond T stock. It used this stock to block a previous merger move on White's part two years ago.

But now Simon D. Den Uyl, Bohn president, admits his firm is negotiating with "someone" for sale of Diamond T stock.

Denial — Mr. Bauman denies White is the candidate. He says: "The company is not in any way involved in negotiations for the assets of Diamond T Motor Car Co. or its stock."

Company sources say this is true for the moment, but they look for a change in the situation.

Potential—If White does acquire Diamond T, it will be buying plenty of experience in lightweight construction (the 16,000-lb and up class).

This ties in with growing rumors that at least one heavy truck builder will move to an all aluminum frame within a year or two.

Payload possibilities of lightweight construction added to a new V-type diesel engine (see STEEL, June 3, p. 83), can brew potent medicine for White in the independent, heavy duty market.

Summer Slump Arrives

Passenger car production seems to be moving into its summer doldrums. The drop probably won't equal last year's fall-off for two reasons:

- Chrysler Corp. is keeping production going to make up for time lost during strikes and because it has a strong sales demand.
- Dealer stocks aren't quite as high as they were in 1956, which means drastic production cutbacks won't be necessary.

Employment—The effect on employment hasn't been felt fully yet. Layoff figures have been trickling in all spring. Car builders will have to start dropping more men as they move into the close-out period of '57 model building.

The Michigan Employment Security Commission reports auto makers will cut 5000 men from the payroll during June.

This means manufacturing employment (mostly automotive) will have decreased more than 11,000 in motordom's capital since Mar. 15. Chances are another 5000 or 6000 will be jobless by the end of July.

Although employment totals may sink lower, the downtrend has been predictable. And it hasn't been as severe as last year's. Some 22,000 fewer men have been laid off this spring, according to MESC charts. The employment curve should start climbing in August.

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
5 Mo. Total	2,872,617	2,762,228
June		430,373
July		448,876
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
May 18	127,390	105,763
May 25	127,428	108,126
June 1	82,431	77,433
June 8	129,517	104,984
June 15	124,795†	100,689
June 22	123,000*	105,243

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Chevy Improves Springs

Chevrolet Division, General Motors Corp., is free-quenching car springs in an oil bath immediately after coiling. E. H. Kelley, general manufacturing manager, says the revised technique hardens the spring more uniformly and provides a closer load-spread factor.

The development follows two years of research on the subject, reports Mr. Kelley. The process is being used at Chevy's Livonia, Mich., spring and bumper plant.

Under the old system, springs might be coiled for several days before going through a reheating and quenching process. By using the new technique, the Livonia plant has been able to eliminate a rotary gas furnace and a quenching machine from the production system.

Fleet Sales Boom Seen

American Motors Corp.'s government and fleet sales division expects a 50 per cent increase in sales this year. "Last year's sales were double those of 1955 when the division first was formed," says W. B. Ramsey, director.

Total Rambler sales in the current fiscal year are running 26.7 per cent ahead of the preceding year's, Roy Abernethy, vice president, automotive distribution and marketing, adds.

Discussing fleet sales, Mr. Ramsey says: "These steady increases are due mainly to the increasing popularity of the Rambler which has proved to fleet buyers its economy of operation and high resale value."

To back up this claim, he cites a case study of a car rental firm which bought 100 Ramblers. Mr. Ramsey says these cars depreciated $150 per unit after nine months, compared with $550 and $600 for similar low priced autos.

FACTS

about

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NOW A NEW DEPARTURE IN PILLOW BLOCKS

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- 31 shaft sizes, ½" through 2 7/16".
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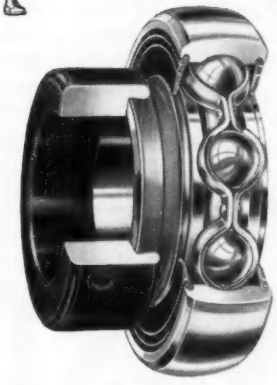
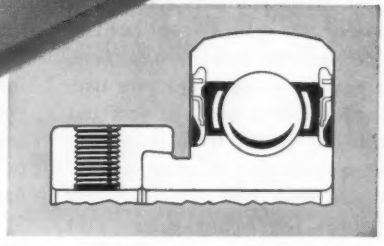
FAMOUS SENTRI-SEAL



New Departure Pillow Blocks employ the performance-proved New Departure Type AE Adapter ball bearings with spherical O.D. for alignability and steel-reinforced Sentri-Seals for long life protection against dirt or grease leakage.



The bearings are easily applied to the shafting and are positively locked in position with an eccentric cam locking collar and set screw.

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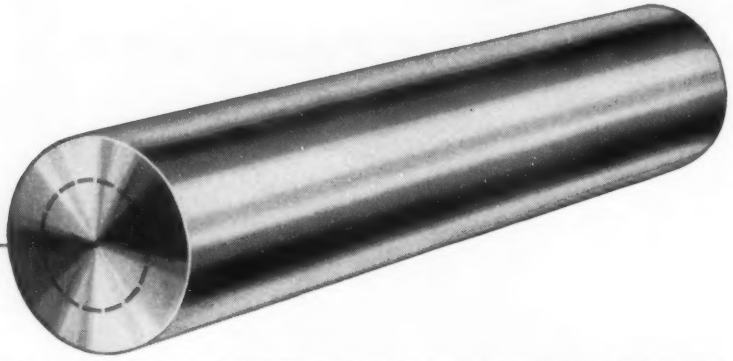
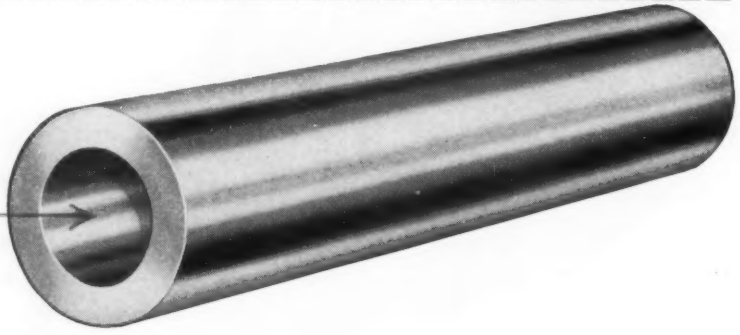


When you can start with this?



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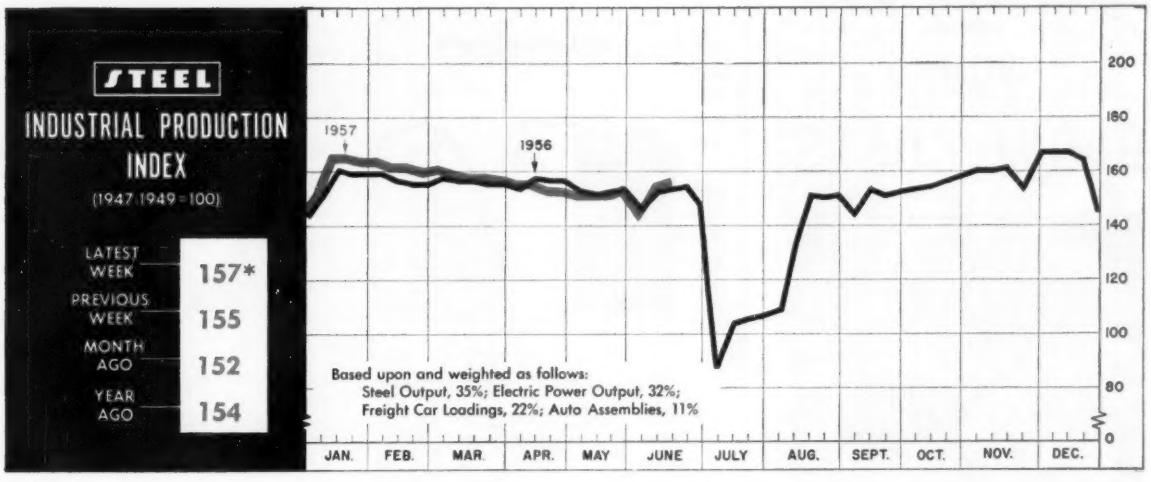
SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended June 15.

At Midpoint, Record Year Seems Assured

WE'RE MIDWAY through 1957, and so far the economy has not taken the nose dive many persons predicted it would. And it isn't likely that there will be any slippage during the second half.

Economists for the U.S. Chamber of Commerce have little doubt that over-all this will be the best year in the nation's history. Corporate profits could set a record, bettering the $22.1 billion racked up in 1950. The big qualification here is the inflation factor. Profits last year ran close to $21 billion, and if dividend payments are any indication, they are running ahead of that so far in 1957. Latest Department of Commerce figures show that dividend payments during the first five months of this year were $3.9 billion, 3.5 per cent ahead of those in the corresponding year-ago period. Manufacturing industries accounted for more than half the increase.

Hand in Hand—Employment and production also will set records, the chamber predicts. Total employment in May reached 65.2 million, virtually the same as in May, 1956, as the number of nonfarm workers came to 52.4 million. That was a record for the month and about 750,000 higher than a year ago, say the Labor and Commerce departments. Weather damage to crops may keep the seasonal peak in August below previous estimates, but a record is still possible.

Production is running well ahead of the year-ago level. The average of the Federal Reserve Board's industrial production index for the first half of 1957 will be about 2.5 percentage points above the comparable period of last year. (It was 143 per cent of the 1947-1949 base in May, compared with 141 a year ago.) Uninterrupted steel production next month will give us an advantage over last July. Monthly records are anticipated during the balance of 1957.

Room To Spare—John S. Coleman, president of Burroughs Corp.,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,240[1]	2,214	2,290
Electric Power Distributed (million kw-hr)	11,850[1]	11,550	11,425
Bituminous Coal Output (1000 tons)	10,015[1]	8,900	9,703
Petroleum Production (daily avg—1000 bbl)	7,250[1]	7,338	7,066
Construction Volume (*ENR*—millions)	$417.7	$442.7	$511.9
Auto, Truck Output, U. S., Canada (*Ward's*)	156,084[1]	163,438	133,571
TRADE			
Freight Car Loadings (1000 cars)	725[1]	733	801
Business Failures (Dun & Bradstreet)	289	225	257
Currency in Circulation (millions)[3]	$30,903	$30,836	$30,542
Dept. Store Sales (changes from year ago)[3]	0%	+1%	+9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,846	$18,812	$21,143
Federal Gross Debt (billions)	$247.6	$275.2	$276.3
Bond Volume, NYSE (millions)	$21.3	$20.4	$15.2
Stocks Sales, NYSE (thousands of shares)	13,229	10,861	8,875
Loans and Investments (billions)[4]	$85.2	$86.2	$84.7
U. S. Govt. Obligations Held (billions)[4]	$25.8	$25.9	$26.7
PRICES			
STEEL's Finished Steel Price Index[5]	228.59	228.59	210.45
STEEL's Nonferrous Metal Price Index[6]	227.4	230.3	276.2
All Commodities[7]	117.5	117.5	114.2
Commodities Other Than Farm & Foods[7]	125.3	125.3	121.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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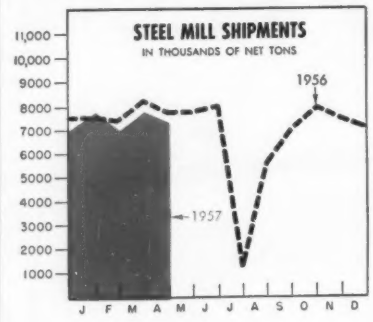
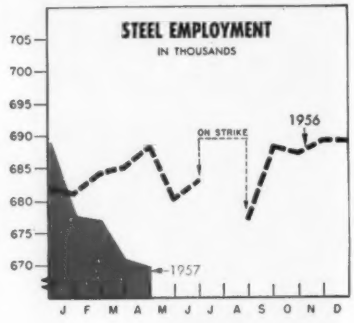
THE BUSINESS TREND



	Net Tons		
	1957	1956	1955
Jan.	7,809,451	7,587,870	6,009,958
Feb.	7,066,732	7,468,393	6,119,900
Mar.	7,821,616	8,255,824	7,268,795
Apr.	7,349,752	7,783,873	7,279,321
May	.....	7,764,776	7,540,889
June	.....	8,077,805	7,770,213
July	.....	1,288,988	6,250,597
Aug.	.....	5,539,915	7,053,615
Sept.	.....	7,058,028	7,378,247
Oct.	.....	7,930,957	7,216,821
Nov.	.....	7,431,136	7,247,994
Dec.	.....	7,064,093	7,580,943

American Iron & Steel Institute.



	Employment in Thousands		Payroll in Millions	
	1957	1956	1957	1956
Jan.	678	681	$360.4	$329.1
Feb.	677	684	327.5	317.3
Mar.	671	685	344.2	338.1
Apr.	670	688	332.5	326.7
May	...	680	....	333.6
June	...	683	....	332.4
July	...	n.a.	....	n.a.
Aug.	...	677	....	300.9
Sept.	...	688	....	339.0
Oct.	...	687	....	358.9
Nov.	...	689	....	346.0
Dec.	...	689	....	347.2

n.a.=not available because of strike.
American Iron & Steel Institute.

Charts copyright, 1957, STEEL.

Detroit, and chairman of the chamber, believes that manufacturing industries as a whole are running at about 84 per cent of capacity. He says we are "evenly poised" and predicts our economy will continue its present rate of activity in the last half.

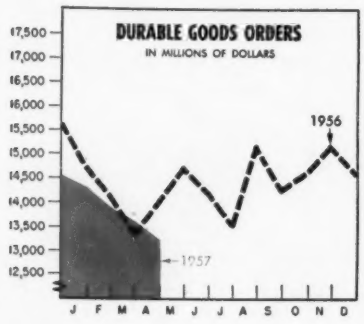
Fred I. Rowe, chairman of the construction and civic development committee, predicts that unit volume of new construction put in place will be greater in 1957 than in 1956. Dollar volume is currently about 3 per cent ahead. Crash projects to get highway contracts under the federal highway act will get the program moving this year. During the next school year, 108,000 classrooms will be added, compared with only 70,000 last year. Housing starts could go over 1 million this year if GI loan rates are increased. The 96,000 starts in May represented an annual rate of 990,000 units, 12 per cent ahead of the eight-year low reached in March, according to latest Department of Labor figures. Starts for the first five months came to 405,800 units, 15 per cent below the comparable 1956 figure.

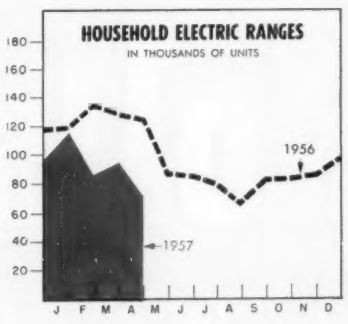
Full Steam Ahead—Dr. Emerson P. Schmidt, economic research director for the chamber, summed up the situation by estimating that gross national product for 1957 will be between $435 billion and $440 billion, a record. This would be about 6 per cent above the figure for 1956.

A word of caution was sounded by William A. McDonnell, chairman of the chamber's finance committee and board chairman of the First National Bank of St. Louis: "We've got too much expansion too fast. We've got to slow up. Industry should take a second look at its expansion plans, and the government should take a second look at its expenditures."

Index Moves Up

STEEL's industrial production index hit the highest point in 12 weeks when it registered a preliminary 157 (1947-1949 = 100) for the week ended June 15. The greatest strength among the components stems from output of electric energy. While the year-to-year gains have not been as great in 1957 as they were in 1956, the advantage still has averaged about 5 or 6 per cent. This alone gives the current index figures a 2 or 3 point boost over corresponding year-ago tabulations. In addition,





	New Orders* 1957	New Orders* 1956	Sales* 1957	Sales* 1956
Jan.	14,393	14,683	14,642	13,595
Feb.	13,979	14,107	14,726	13,593
Mar.	13,524	13,337	14,438	13,294
Apr.	13,214†	14,073	14,100†	13,519
May	.....	14,732	.....	13,754
June	.....	14,185	.....	13,850
July	.....	13,513	.....	12,627
Aug.	.....	15,166	.....	13,665
Sept.	.....	14,266	.....	13,692
Oct.	.....	14,591	.....	14,199
Nov.	.....	15,130	.....	14,321
Dec.	.....	14,544	.....	14,507

*Seasonally adjusted. †Preliminary.
U.S. Office of Business Economics.

Total Factory Sales—Units	1957	1956	1955
Jan.	116,600	119,500	136,663
Feb.	87,600	132,900	127,188
Mar.	95,200	127,500	130,180
Apr.	72,000	124,300	108,619
May	.....	85,977	109,263
June	.....	84,562	105,088
July	.....	79,766	85,629
Aug.	.....	64,826	76,158
Sept.	.....	82,385	101,100
Oct.	.....	82,700	103,610
Nov.	.....	85,600	88,290
Dec.	.....	96,400	118,161
Totals	.....	1,166,416	1,289,949

National Electrical Mfrs. Assn.

auto and truck production during the second quarter is running about 10 per cent ahead of last year's period, says *Ward's Automotive Reports*, adding another 3 point advantage to the current index.

On the debit side are steel output and freight car loadings. In the case of steel, the position is about to change. Lower steel oprations this year than last have been wiping out a point or two of the gains mentioned above. When final production figures are in for the week ended June 23, that gap should be noticeably narrowed. The big change will come in the week ended June 30. Steelmakers cut output in the last week of June, 1956, in preparation for the steelworkers' strike.

Car loadings are still far behind the year-ago pace, but during July and August, they, too, should be ahead of the 1956 figures because of the steel strike.

Wholesale Prices Dip

The wholesale price index so far this year has set a pattern of alternating advances and decreases, with advances exerting a little more influence than decreases. The Bureau of Labor Statistics reports a reading of 117.1 (1947-1949 = 100) for May, down from the April level of 117.2. Although this is the second time the index has eased this year, it is still above the January level of 116.9. Farm products and all commodities other than farm and foods went down in May, while processed foods advanced fractionally. Weekly figures indicate that the pattern will continue, with an increase to about 117.3 in the total index during June.

Trends Fore and Aft

• An indication of increased demand for home laundry equipment comes from Maytag Co., Newton, Iowa. The company is recalling 235 of 550 workers laid off in April so inventory adjustments could be made.

• In 1965, consumption of steel in the Far West will be close to 10 million tons, predicts Edgar F. Kaiser, vice president, Kaiser Steel Corp., Oakland, Calif. Last year it was only 6.5 million tons.

• Personal income in May was a record $340.4 billion (annual rate), $17.6 billion higher than it was in May, 1956.

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OUR 50th YEAR
1907
1957

THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO

Plants at Lima and Springfield, Ohio

OR3

VERNON H. PATTERSON
Texas Foundries sales mgr.

ROBERT M. BRINEY
Haynes Stellite president

RAYMOND E. MATTOCKS
Western Brass Mills post

ROBERT F. REID
Arter Grinding sales mgr.

Vernon H. Patterson was made sales manager of **Texas Foundries Inc.**, Lufkin, Tex. He was manager of foundry sales for Climax Molybdenum Co. **Arthur P. Guidi** transfers from sales manager to the new post of assistant plant manager. **Fred Jacobs** was made technical director; **Stan Smith**, chief metallurgist.

Kenneth F. Middaugh was appointed plant manager in charge of welding operations of **Sylvania Electric Products Inc.**, with headquarters at its Warren, Pa., plant.

Thomas E. Johnston was made general purchasing agent for **Aerojet-General Corp.**, Azusa, Calif.

Henry J. Waldeck Jr. was named chief engineer of **Ohio Structural Steel Co.**, Newton Falls, O.

John Roback, chief project engineer, was promoted to engineering manager, data reduction and automation division, **Fischer & Porter Co.**, Hatboro, Pa. **C. R. Lambert** was made operations manager of the division. He was with Daystrom Inc. **Norbert Weber** was made assistant sales manager.

Robert F. Marlin was made purchasing agent for the parts division of **Sylvania Electric Products Inc.** at Warren, Pa.

Ernest A. Gardner was named director of engineering for **Heltzel Steel Form & Iron Co.**, Warren, O. He was sales manager-industrial sales.

Robert M. Briney was appointed president, **Haynes Stellite Co.**, division of Union Carbide Corp., Kokomo, Ind. He became vice president in charge of wrought alloy products in 1950 and was transferred to the division's New York office in 1954.

Raymond E. Mattocks was made manager of industrial engineering for **Western Brass Mills Division**, East Alton, Ill., Olin Mathieson Chemical Corp.

Robert H. Morse Jr. was elected president and chief executive officer of **Fairbanks, Morse & Co.**, Chicago. **Gordon R. Anderson** was made vice president-engineering; **F. M. Mason Jr.**, vice president-government business. Reassigned are: **Robert H. Morse III** from vice president-sales to vice president in charge of budgets and planning, a new section; **V. H. Peterson**, from vice president-engineering to vice president-sales; **John A. Cuneo**, from vice president and assistant to the president to vice president-foreign operations. **John C. Elmburg** was made general sales manager; **G. R. Anderson**, chief engineer.

Charles P. Hammond, general superintendent of mills for Northeastern Steel Corp., has joined **A. M. Byers Co.**, Pittsburgh, as assistant to the vice president-operations.

Paul W. Wyckoff, chief engineer, was made director of all engineering activities for **Airtemp Division**, Chrysler Corp., Dayton, O.

Robert F. Reid was made sales manager for **Arter Grinding Machine Co.**, Worcester, Mass. He was with the machinery sales programs of Gardner Machine Co., division of Landis Tool Co., and Reid Bros. Co. Inc. **William J. Arter** and **Bruce MacGilvra** will assist Mr. Reid.

Ralph H. Walker was elected president and treasurer of **Lawson Machine & Tool Co.**, Malden, Mass. He succeeds the late **Chester M. Lawson. Ralph E. Stevens**, general superintendent, succeeds Mr. Walker as vice president.

Paul L. McKeever was made assistant works engineer-operations, Butler, Pa., Works, **Armco Steel Corp. Ward B. Browning Jr.** was named assistant works engineer-development and construction. **B. Chandler Huselton** was made assistant to the plant manager.

Titanium Metals Corp. of America, New York, appointed **James E. Albright** manager of sales, eastern district. He succeeds **Donald B. Dik**, now product manager of flat-rolled products.

Howard N. Hubbard was made assistant general superintendent at **National Tube Division's** National Works, U.S. Steel Corp., at McKeesport, Pa. He succeeds **William L. Fader** who transfers to a similar position at the division's Lorain, O., Works.

Richard A. Schoenfeld was made executive vice president, **Lindberg Industrial Corp.**, Chicago. He was

E. P. BULLARD III

E. C. BULLARD

Bullard Co. executive changes

J. W. HELSING

L. P. MAEDER

National Electric Products purchasing agents

administrative assistant to vice president-sales at Lindberg Engineering Co.

E. P. Bullard III was elected president and general manager, **Bullard Co.**, Bridgeport, Conn. He succeeds **E. C. Bullard** who was elected chairman and chief executive officer, effective July 15.

Roland G. Hillboro was elected executive vice president and general manager of **Downey-Hill Mfg. Co.**, Reseda, Calif.

Eli Marinovich was made supervisor of production planning at **Kaiser Steel Corp.**, Fontana, Calif.

Royce D. Northcutt was made manager of the Trenton, N. J., plant of U.S. Steel Corp.'s **American Bridge Division.** He succeeds **James A. Dunn**, transferred to the division's Ambridge, Pa., plant.

Dr. W. H. Jukkola was appointed supervisor-chemical services section for **Jones & Laughlin Steel Corp.**, Pittsburgh.

Carl W. Polonus was made manager of the Milwaukee district sales office of **Sharon Steel Corp.**

Frank B. Sykes was made sales manager of the new commercial crane carrier division of **Four Wheel Drive Auto Co.**, Clintonville, Wis.

E. C. Westphal was named an assistant sales manager at **Rolled Steel Corp.**, Skokie, Ill.

Daubert Chemical Co., Chicago, appointed **E. B. Jared** sales manager, adhesives and sealers division. He served in a similar capacity with the industrial products division of B. F. Goodrich Co.

S. D. Saul, sales manager, was promoted to general sales manager at **Plasteel Products Corp.**, Washington, Pa.

Joseph J. Hiegel, former chief electrical engineer for **E. W. Bliss Co.'s** rolling mill division, Salem, O., was made assistant chief engineer for the division.

Stephen B. Sponder was made plant manager at **Baker Bros. Inc.**, Toledo, O.

F. J. Guenther was named purchasing agent for the technical products division of **Mine Safety Appliances Co.**, Pittsburgh.

National Electric Products Corp., Pittsburgh, appointed **J. W. Helsing** purchasing agent for wire and cable products; **L. P. Maeder** purchasing agent for steel products.

Phillip E. Campbell was made sales manager-gas truck section and **John Borman** sales manager-attachments section, Industrial Truck Division, Battle Creek, Mich., **Clark Equipment Co.**

Howard F. Cole was named sales manager for **United States Steel Corp.'s** Supply Division at Newark, N. J. He was office manager at San Francisco.

Robert W. Saxton was made assistant general sales manager of

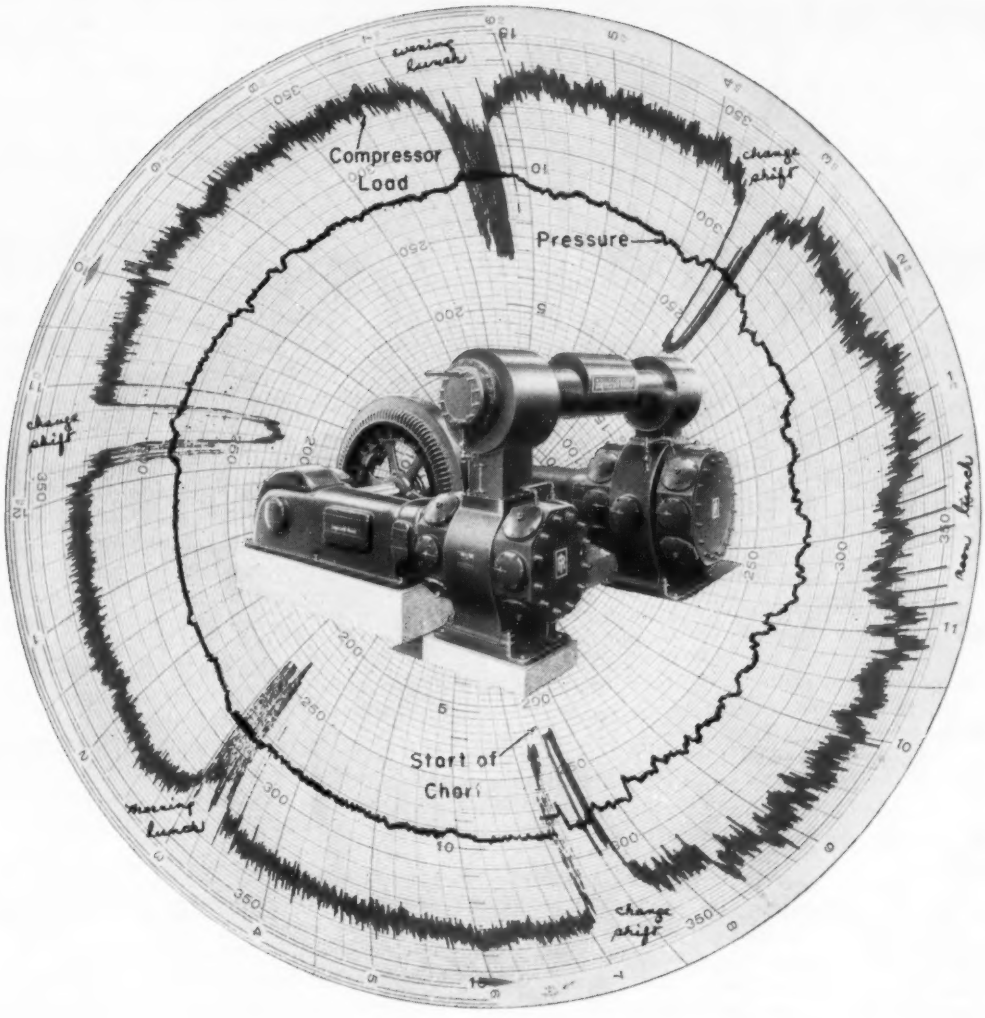
LUTHER H. BOSNIAN

WILLIAM J. SPARLING

EDWARD M. RHODES

management positions at Chain Belt Co.

Chain Belt Co., Milwaukee, appointed **Luther H. Bosnian** senior vice president; **William J. Sparling**, vice president-manufacturing and facilities; **Edward M. Rhodes**, general manager-industrial equipment section; **Harold Patzer**, sales manager-foundries. Retired as of May 31 are: **Alfred R. Abelt**, vice president-sales; **E. P. Meyer**, works manager-Milwaukee plants; **L. J. Michiel**, sales manager-foundries.



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BRUCE E. HORST
Barber-Colman sales post

LLOYD L. BRIGHTMAN
Mexico Refractories Texas post

ALBERT A. MONNETT JR.
U.S. Steel distribution post

Tranter Mfg. Inc., Lansing, Mich.

Bruce E. Horst was made sales manager, machine tool division, **Barber-Colman Co.**, Rockford, Ill. He is replaced as sales representative in the Rockford area by **Wesley Morse.**

Lloyd L. Brightman was made vice president and general manager of **Mexico Refractories Co. of Texas,** successor to Royall Fire Brick & Supply Co., with offices and warehouses in Houston and Dallas. **Morris S. Lindsey** was appointed sales manager.

Walter H. Schulte was made manager of sales, nonferrous metals division, **Zalk Steel & Supply Co.**, Minneapolis. He was branch manager, Federated Metals Division, American Smelting & Refining Co.

Robert J. McCarthy was named central states manager of industrial and distributor sales for **Central Screw Co.** He is at Chicago.

Ed Kinney joined **American Electronics Inc.**, Los Angeles, as chief engineer of its audio and recordata divisions.

John G. Kearns was made production manager of **Lord Chemical** Corp., York, Pa. He was with York-Shipley Inc. as vice president and manager of residential heating and cooling equipment sales.

Donald W. Shoemaker was named manager of manufacturing for **Corhart Refractories Co. Inc.**, Louisville. He was manager of Corning Glass Works's refractories plant at Corning, N. Y.

Albert A. Monnett Jr. was made director of distribution and availability division, commercial department, **United States Steel Corp.**, Pittsburgh. He succeeds **Robert E. Williams,** now general sales manager, National Tube Division.

C. R. Dernbach was named sales manager for **Trombetta Solenoid Corp.**, Milwaukee.

Roscoe J. Ryan was appointed to head technical sales at **Ardmore Mfg. Co.**, San Diego, Calif.

Crucible Steel Co. of America appointed **J. J. Wycall** manager of its St. Louis sales branch to succeed **K. C. Kelly** who fills the new post of southern regional sales manager.

Robert P. Marshall was named factory superintendent of **Trane Co.'s** new plant which will be erected at Clarksville, Tenn.

Frank Wright was made manager of the **Ford Motor Co.** stamping plant in Buffalo. Former production manager, he succeeds **Frank J. Bushroe,** now manager of the Chicago stamping plant.

Joseph B. Stazinski was made manager-manufacturing of the Elmira, N. Y., foundries, **General Electric Co.**, succeeding **N. Harold Boardman,** now a consultant.

Richard F. Ringham was made sales manager-central division, **Exothermic Alloys Sales & Service Inc.** He is at Pittsburgh.

Robertshaw-Fulton Controls Co., Greensburg, Pa., elected **Thomas T. Arden** president to succeed **John A. Robertshaw,** now chairman. **Richard S. Reynolds Jr.,** former chairman, now heads a three-man executive committee.

William R. Kennedy was made assistant sales manager, **Hammel-Dahl Co.**, Providence, R. I.

Robert A. Hummert was named Seattle manager for **DeWalt Inc.**, a subsidiary of American Machine & Foundry Co.

T. J. Schuetz was made sales manager, towing tractor section, a new operation of **Frank G. Hough Co.**, Libertyville, Ill.

John C. Ewer was made assistant sales manager-abrasives, **Norton Co.**, Worcester, Mass. He just completed a seven-year assignment as managing director of Norton Grinding Wheel Co. Ltd., England. He is replaced by **Arnold W. Lee.**

Richard T. Baureithel was made district sales manager in charge of the Philadelphia office of **Beryllium Corp. George E. Scargle,** formerly with Whitehead Metal Products Co., was made field sales engineer at Philadelphia.

OBITUARIES...

Irving W. Reynolds, 77, vice president, **Foxboro Co.**, Foxboro, Mass., died June 3.

Louis G. Keith, assistant purchasing agent for **Phelps Dodge Copper Products Corp.**, at Elizabeth, N. Y., died June 10.

Howard F. Eaton, chief engineer, **Electric Materials Co.**, North East, Pa., died recently.

Reuben L. Kirby, 63, superintendent, **Ross Midwest Co.**, Dayton, O., died June 5.

George J. Ehrhardt, 62, chief engineer, Clamshell Bucket department, **Blaw-Knox Co.**, Pittsburgh, died June 4.

Thorvald N. Garson, 75, chairman, **Bergen Point Iron Works,** Bayonne, N.J., died recently.

A. Arthur Jenkins, assistant to the vice president and assistant secretary of **Bethlehem Steel Co.**, Bethlehem, Pa., died June 10.

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Granite City Steel...

has been using Air Products oxygen generators since 1950. Complete dependability of these units . . . and flexibility in Air Products design . . . has resulted in the installation of another, larger generator at Granite City.

This continuity of oxygen production over the past seven years has been possible only through the use of the dependable "on-location" generators — designed and manufactured by Air Products.

Flexibility of supply at Granite City Steel is a typical benefit resulting from steel companies' use of "on-site" generators. Other steel companies enjoy such profitable advantages as: substantial reductions in oxygen cost . . . continuity of supply . . . dependable production of high purity oxygen 24 hours/day. Even plants requiring limited quantities of oxygen can profitably use Air Products generators.

Let us show you how you can have a dependable low cost supply of oxygen without capital investment. Air Products on-site oxygen generators supply many of the nation's leading steel plants. We'd like to talk to you about them . . . your inquiry is invited. Air Products, Incorporated, P.O. Box 538, Allentown, Pa.

Air Products ...INCORPORATED

Republic Expands

New facilities at Gadsden, Ala., make the firm a major supplier of flat-rolled steel in South

REPUBLIC STEEL Corp. is operating a new electric steelmaking furnace and a new strip mill at its Gadsden, Ala., plant. The plant's multimillion dollar expansion program (STEEL, Jan. 14, p. 39), which has been in the construction stage for two years, will continue with the installation of a second electric furnace and other equipment later this year.

The Gadsden project is part of Republic's over-all program to increase ingot production capacity by 2 million tons (to a total of 12,240,000 tons) by the end of this year.

The two electric furnaces, with a combined capacity of 408,000 tons a year, will boost ingot capacity at Gadsden by more than 50 per cent —from 789,000 tons (eight open-hearth furnaces) to 1,197,000 tons. The electrics are 24 ft in diameter and can turn out 175 tons of steel per heat.

More Flat Rolled—The new strip mill will increase Gadsden's production of galvanized sheets and roofing from an average of 4000 tons a month to 10,000 tons. It also will put the plant in the coil sheet picture for the first time.

Besides the 10,000 tons of galvanized, monthly production goals call for 13,300 tons of cold-rolled and 7000 tons of hot-rolled sheets in coils or cut lengths.

Strip mill equipment centers on a 54-in. hot strip mill and a 54-in., 3-stand tandem cold mill, designed to turn out finished product up to 48 in. wide; a 54-in. temper mill; a continuous pickle line which can handle 20-ton coils; a 48-in. continuous galvanizing line; an annealing department; 48-in. cold cutting and hot cutting lines; and a multiple slitter for making narrow bands from coils.

The equipment will produce hot and cold-rolled and galvanized sheets up to 48 in. wide in coils or cut lengths.

Hewitt-Robins To Build Plant

A 60,000 sq-ft plant for the production of industrial wire cloth and wire mesh conveyors will be erected at King of Prussia, Pa., for Hewitt-Robins Inc., Stamford, Conn. The project was announced by H. E. Kleintop, manager of the firm's subsidiary, Korb-Pettit Wire Fabrics & Iron Works Inc., Philadelphia.

Scovill Opens Warehouse

Scovill Mfg. Co., Waterbury, Conn., opened an office and brass and aluminum mill product warehouse at 2536 S. 59th St., Philadelphia, Pa. Holden C. Lewis, district sales manager, is in charge.

Offers High Temperature Alloys

Allvac Metals Co. has been organized and is building a plant in Monroe, N. C. The firm will specialize in the production of high temperature alloys. Basic melting processes will be done in vacuum. James D. Nisbet is president.

U.S. Steel Buys Equipment

Cyclone Fence Department, American Steel & Wire Division, United States Steel Corp., is equipping its Greensburg, Ind., plant for the production of glass fiber insect screen cloth.

Another significant step in the modernization program at the Donora (Pa.) Steel & Wire Works of the division has been accomplished with the installation of a 26,000-ton per month straight-line cleaning house in the wire mill.

The corporation's Gary Works has placed a contract with Surface Combustion Corp., Toledo, O., for the erection of 48 one-way fired soaking pits equipped with the jet pump recuperating systems. The installation will consist of 12 four-hole batteries. Dimensions of pits: 27 ft long, 9 ft 6 in. wide and 15 ft deep. Covers will be operated from crane cabs by electronic remote control. The soaking pits will be part of U.S. Steel's 46-in. slabbing mill expansion program. Their rated annual capacity is 4 million tons.

U.S. Steel Corp.'s Tennessee Coal & Iron Division has established a normalizing, painting and waxing line at its cotton tie mill in Bir-

(*Please turn to page* 104)

Three case histories

How 3 companies improved production by changing to

STANICUT Cutting Oils

Here are reports on three companies that have recorded (1) increases in production (2) better machine performance (3) longer tool life (4) money saved by switching to a STANICUT *Cutting Oil suited to their operations. You can get similar results.*

Standard Oil industrial lubrication specialist, Ray Wells, and Stuart Bergsma, G. A. Brevik manager, inspect carburetor needle valve. Ray recommended plant's switch to STANICUT Oil 137 BCS. He is well qualified to make such recommendations. Ray is a graduate of the Illinois Institute of Technology with a degree in engineering, and he has completed the Standard Oil Sales Engineering School. He has been an industrial lubrication specialist at Standard for six years.

G. A. Brevik Manufacturing Company uses STANICUT Oil 137 BCS

G. A. Brevik Manufacturing Company, Prescott, Michigan, is the largest producer of carburetor needle valves. The company was blending its cutting fluid from four different oils. Still they experienced tool breakage and ring formation on the surface of the stainless steel they were machining. Then one machine was converted to STANICUT Oil 137 BCS to test the oil's suitability for this operation. Soon all machines were converted.

Production increased 25% because of the improved performance of the machine tool. Cutting oil inventories have been reduced from four different oils to one. Tool life has been extended. There is no variation in fluids as there was when four oils were being blended, and there is no messy blending operation.

STANICUT Oil 137 BCS is ideally suited for severe, high speed machining.

A few of the stainless steel parts machined on automatic lathes at G. A. Brevik Manufacturing Company using STANICUT Oil 137 BCS.

STANDARD

Some of the pieces manufactured by Dearborn Centerless Grinding Co. Materials used are stainless steel, Inconel and Nichroloy.

Operator George Laverdiere and Standard Oil lubrication engineer, Leland J. Loomis, examine piece just off Cincinnati centerless grinder. Lee Loomis is another man who knows how to advise on metalworking problems. Lee has had ten years' experience in such work, has an engineering degree from Tri-State College and has graduated from the Standard Oil Company's Sales Engineering School.

Dearborn Centerless Grinding Co. uses STANICUT Oil 126 BCS

Difficult-to-grind stainless steel was the problem at Dearborn Centerless Grinding Company. Wheel loading and wheel break-down were such that soluble type oils weren't satisfactory. For this reason, Dearborn began using STANICUT Oil 126 BCS.

Company management found it secured these six important benefits by changing to STANICUT Oil 126 BCS in grinding operation:

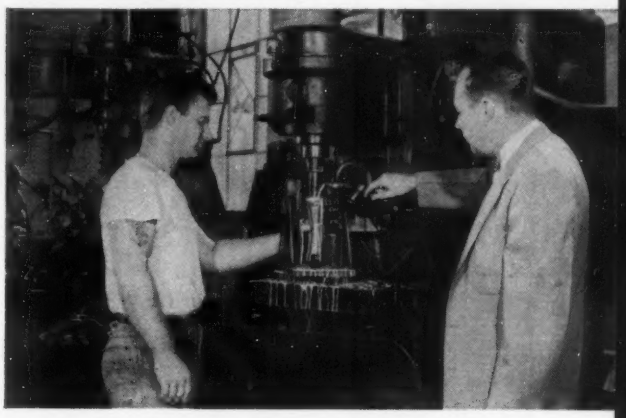
1. Better finishes.
2. More pieces obtained per wheel dress.
3. Superior wheel life obtained on profile jobs.
4. Harder wheels could be used.
5. Finer grit wheels could be used.
6. More stock per pass could be removed.

Woodford Manufacturing Company uses STANICUT Oil 155 CS

This Des Moines manufacturer was drilling and boring a steel wheel fork. Production was at the rate of 45 pieces per hour. Standard Oil lubrication specialist, Jess Nelson, called Woodford plant management's attention to the fact that STANICUT Oil 155 CS was being used successfully elsewhere in the plant. He suggested that much better production and longer tool life would be obtained if STANICUT was used in this operation.

The change, when made, increased production to 78 pieces per hour. Tool life was extended. At the same time, by using STANICUT Oil 155 CS, a 46% reduction in cutting oil costs was achieved.

STANICUT Oil 155 CS is an oil especially formulated for use in machining operations involving tough alloy steels which tend to tear and smear.



Woodford operator Elmer Light checks piece in Sundstrand Rigidmill while Standard Oil man Jess Nelson adjusts cutting oil flow. Jess, too, knows how to advise manufacturers on metalworking problems. He's had more than four years' experience doing such work. In addition, he has a degree in engineering from the University of Iowa and is a graduate of the Standard Oil Company's Sales Engineering School.

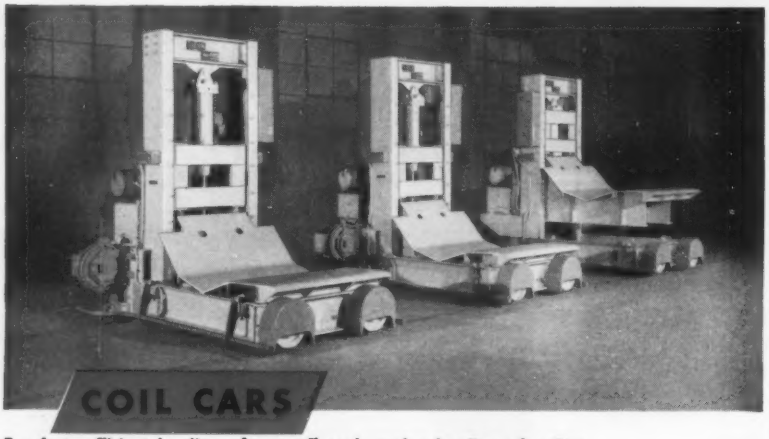
W. B. Noland, Woodford engineer, demonstrates Rollway Dock Plate to Jess Nelson. Parts machined using STANICUT Oil 155 CS are for this unit designed by Noland.

STANDARD OIL COMPANY (Indiana)

Get more data on STANICUT Cutting Oils from your Standard Oil industrial lubrication specialist. One of these men is nearby in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

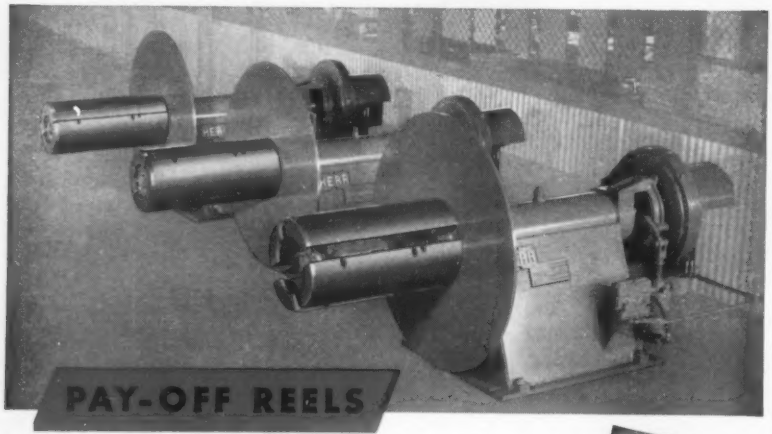
HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



COIL CARS

For fast, efficient loading of pay-off reels and unloading of coiling reels. Sizes to handle coils of any diameter, width or weight. Hydraulic lift, electric traverse. No pits. Can be fitted with coil ejector, up-ender and other accessories if desired. Furnished complete ready for use.



PAY-OFF REELS

Types and sizes for coils weighing from 5,000 to 50,000 lbs. and up to 84" wide. Fixed, adjustable or automatically aligning bases. Timken bearings. Can be equipped with threading drive, also automatic speed compensating drive for feeding presses.

Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1250 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

(*Concluded from page* 101)

mingham for the production of industrial strapping. It is scheduled to produce 2000 tons of strapping a month.

Techalloy Enlarges Facilities

A new conversion department for wire and rods is in operation at Techalloy Co. Inc., Rahns, Pa. Special emphasis is placed on straightened and cut wire and rods in round, square, hex and other special shapes. Diameters of 0.5 to 0.002 in., or equivalent cross sections, can be handled. The department has annealing and pickling equipment for ferrous and nonferrous alloys which require special conversion.

Harcraft Brass Expands

Harcraft Brass has completed an extensive expansion program at its Torrance, Calif., plant. New highly specialized facilities include electronic, heavy duty plating equipment, an analytical control laboratory and increased warehouse space. Harcraft makes a line of plumbers' brass goods, fittings, stops and flexible supplies.

Will Make Hoisting Machines

London Concrete Machinery Co. Ltd., London, Ont., has been licensed by Buck Equipment Corp., Cincinnati, to manufacture Buck portable hoisting machines.

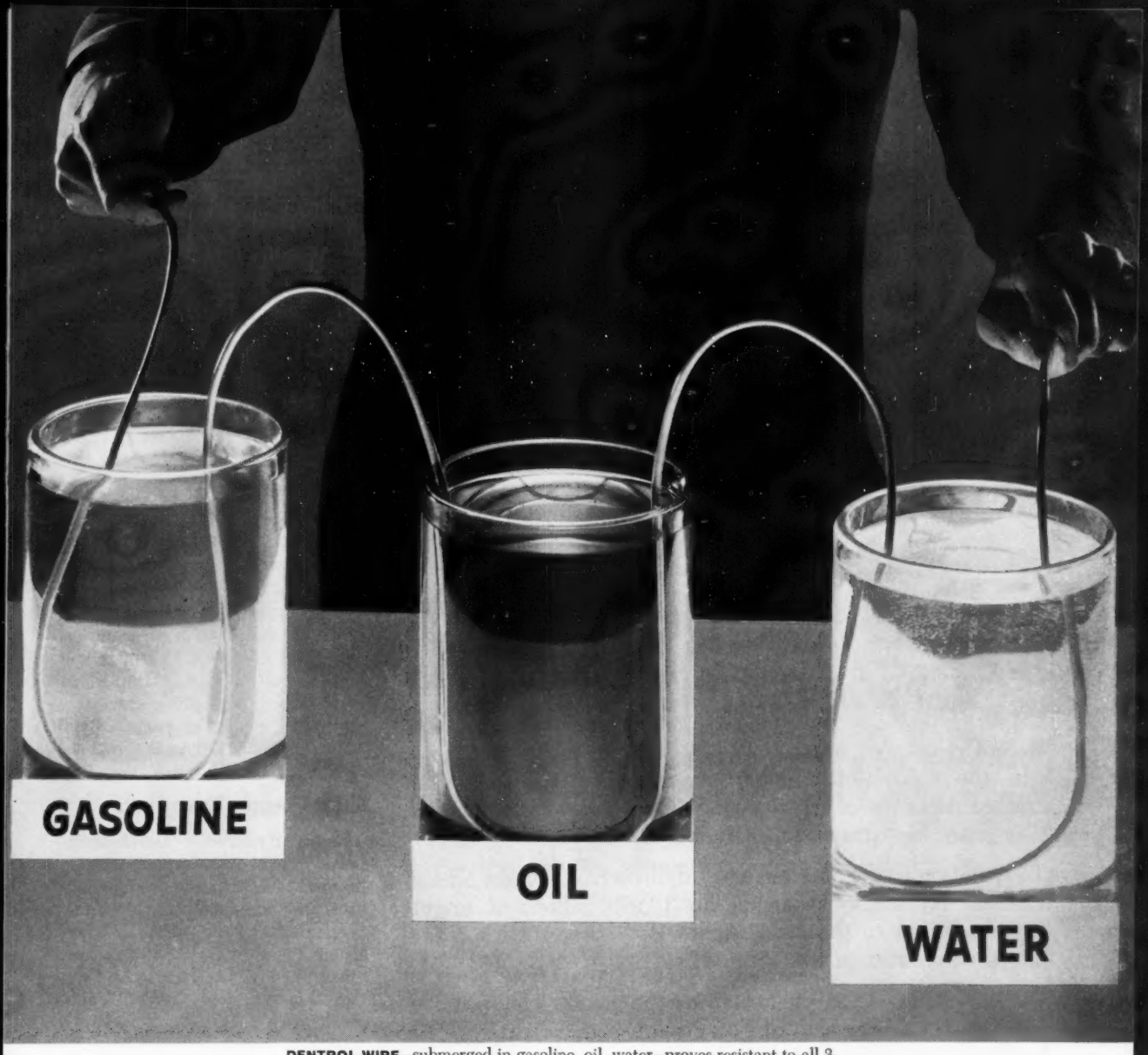
Bristol Co. Opens Branch

Bristol Co., Waterbury, Conn., opened a branch factory and repair laboratory at 6800 E. Acco St., Los Angeles, Calif. It is managed by J. W. Peckham, west coast district manager.

Olin Mathieson Opens Office

Olin Mathieson Chemical Corp., New York, opened a district sales office for its Aluminum Division at 1330 W. Peachtree St. N.W., Atlanta, Ga. John C. Spencer is district sales manager. A branch office at 8340 N.E. Second Ave., Miami, Fla., is managed by K. C. Carothers.

The company has filed an option on a 200-acre tract near Montville,



DENTROL WIRE—submerged in gasoline, oil, water—proves resistant to all 3.

Dentrol, only type of thermoplastic wire that RESISTS ALL 3—GASOLINE, OIL, WATER!

Dentrol wire affords *new safety* wherever wiring is exposed to gasoline or oil—*new economy* over the lead-covered cable you're now using in these areas.

Made with a clear nylon jacket over-all, Dentrol not only beats gasoline, oil and moisture—but is exceptionally resistant to abrasion. It is easily installed (hard, smooth finish makes pulling through conduit simple), easily stripped, lightweight for easy handling.

Suggested uses: for 600 volt wiring for lighting, power and control in and around service stations, refineries, tank farms, and industrial plants.

Dentrol is Underwriters' Laboratories approved as TW and "gasoline-resistant" wire for use in open raceways where exposed to gasoline or gasoline vapors. Thus it meets the provisions of section 5023 of the 1956 National Electrical Code, concerned with installations in hazardous locations.

Available in colors, and in 500′ cartons. See your Anaconda distributor. For information write: Anaconda Wire & Cable Company, 25 Broadway, N. Y. 4, N. Y. 57304

SEE THE MAN FROM ANACONDA®
FOR DENTROL WIRE

AGAIN! UDYLITE Hi-C SOLVES A PRODUCTION PROBLEM

Recently, a large supplier of nickel-plated parts was faced with the problem of doubling his production to meet the increased demands of his customers. There was no additional floor space for extra tanks or equipment.

The solution to the problem was Udylite's Hi-C Bright Nickel Process. By simply changing his 13,000 gallons of bright nickel solution to the new Udylite Hi-C Bright Nickel, the increased production was obtained.

Current densities were increased as the greater conductivity of the high chloride solution permitted higher current with no burning, even without increased agitation.

In addition, this user of Udylite Hi-C Bright Nickel Process benefited by better throwing power, which meant less nickel was used to obtain thickness requirements in recesses. Also, fewer anodes were needed since the Hi-C process provided the best anode corrosion of any nickel bath.

Why not find out what Udylite's exclusive Hi-C Bright Nickel Process can do for you? Write today for a new free folder describing Hi-C Processes for rack and barrel plating—or call your nearby Udylite representative.

THE Udylite CORPORATION DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

Conn., as a possible site for a nuclear reactor core assembly plant. Several other sites are under consideration. A pilot plant is being operated by the Nuclear Fuels Division at the Winchester-Western Division in New Haven, Conn.

Buys Steveco Fan Division

Manufacturers Equipment Co., Dayton, O., has expanded its line of industrial ventilating equipment through the purchase of the Steveco Fan Division of Stevenson Co., Wellsville, O.

Convair Installing Press

Convair, a division of General Dynamics Corp., San Diego, Calif., has completed excavation for a $500,000 stretch press, said to be one of the largest ever built. It is a 75-ton, 360-degree device, measuring 75 x 30 x 12 ft, and will be equipped with a 35-ton transverse wiper, permitting extremely accurate forming of parts. Cyril Bath Co., Solon, O., made the press.

Shaw Licenses Three Firms

Shaw Process Development Corp., Port Washington, N. Y., licensed these firms to produce cavities and cores with its precision investment casting process: Precision Plastics Co., Philadelphia; Star Foundry Inc., Ft. Wayne, Ind.; and General Mold Casting Corp., Newark, N. J.

Electroplating Design Renamed

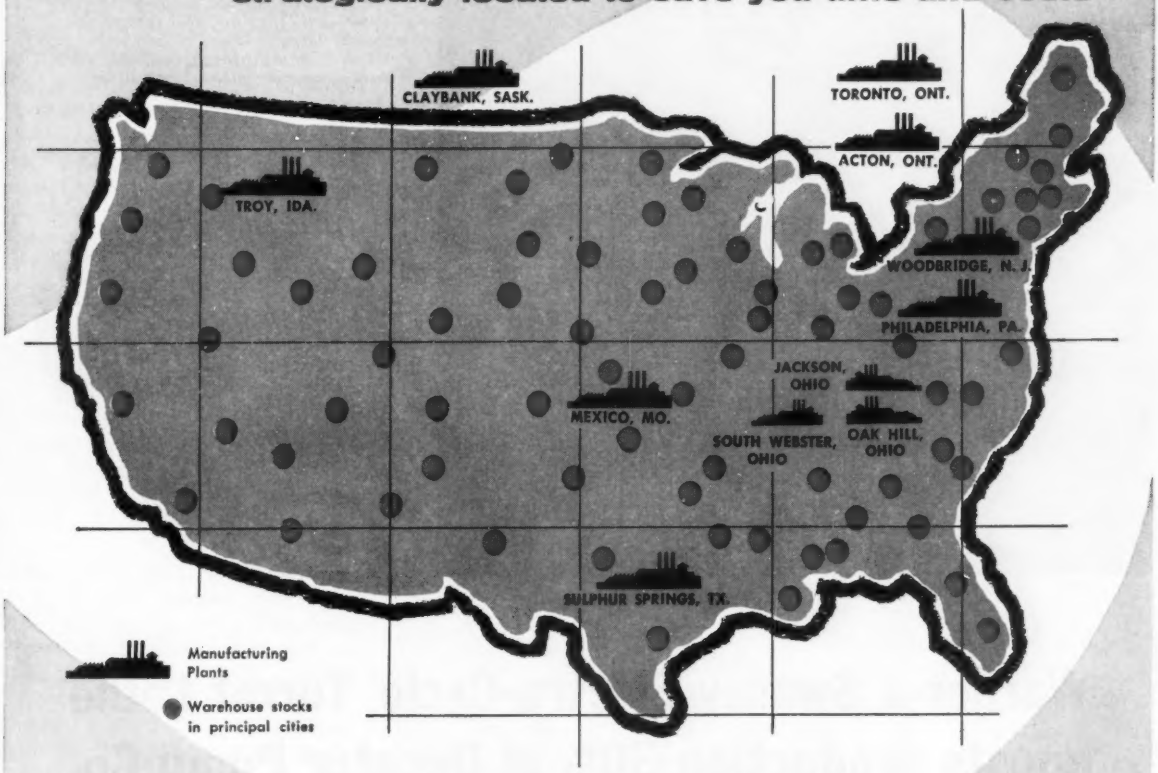
Electroplating Design Inc., Belleville, N. J., changed its name to Bart Laboratories & Design Inc. Officers are: President, S. G. Bart; vice president and chief engineer, A. G. Buschow; director of research, Dr. D. S. Carr.

GE Building Furnace Facility

A $500,000 furnace facility is being constructed for General Electric Co.'s Small Aircraft Engine Department at Everett, Mass. With this additional 9500 sq ft of space, 15,000 sq ft will be available to house the furnace equipment—including six electric and gas fired furnaces and gas producing and purification equipment. The facil-

A. P. Green
REFRACTORY PRODUCTS

manufacturing and warehouse facilities strategically located to save you time and costs



11 A. P. Green manufacturing plants and warehouse stocks conveniently located throughout the United States and Canada, Save You Money 7 Ways.

- **Lower Shipping Costs . . . from nearby manufacturing or warehouse point.**
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- **Lower Inventory Costs . . . you need inventory only for *immediate* needs.**
- **Lower Inventory Losses . . . buy on current prices . . . less breakage while in storage.**
- **Increase Production Space . . . free storage space for profitable production.**
- **Lower Labor Costs . . . deliveries to point of usage . . . no inplant moving of stocks.**
- **Maintain Steady Production . . . reduce down time waiting for materials.**

Your A. P. Green Distributor is Listed In The Yellow Pages of Your Telephone Directory, or write:

A. P. GREEN FIRE BRICK COMPANY
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PLANTS:
Mexico, Mo. — Woodbridge, N. J. — Sulphur Springs, Texas — Jackson, Oak Hill, South Webster, Ohio — Philadelphia, Pa. — Troy, Idaho.

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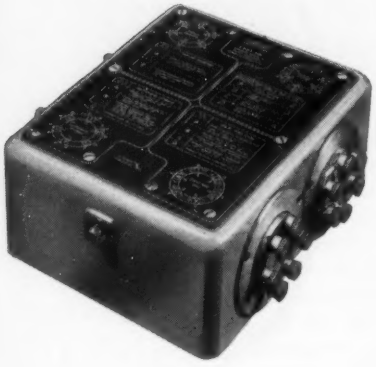
Distributors In The Principal Cities of The World

By simply presetting this Electro-Cycle Drum Control, spindle speed, starts and stops, spindle direction and reverses for each turret face are automatically controlled. Your operator can quickly handle large volumes of precision work, without tiring himself on time-consuming manual operations.



Warner & Swasey Electro-Cycle® Turret Lathe boosts production 30% at Decatur Pump Co.

Automatic lathe operation, provided by the Electro-Cycle principle, substantially reduced both handling time and operator fatigue. Immediately, production increased and profits improved.

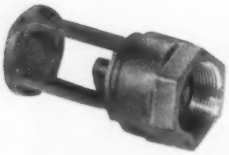
This nationally-known producer of "Burks" Super Turbine and Centrifugal pumps, located in Decatur, Illinois, recently replaced a conventional geared head turret lathe with a new Warner & Swasey No. 3 Electro-Cycle. Immediately, their production of pump jet bodies—machined from bronze castings—increased 30%.

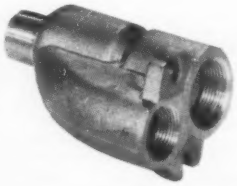
Using his new Electro-Cycle, the operator easily produced more finished parts per shift because:

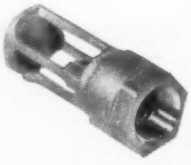
- **Workpiece handling was cut to a minimum.**
- **Fatigue was substantially reduced.**
- **Automatic operation eliminated all time-consuming hand work.**

On both ferrous and non-ferrous materials, Electro-Cycles are daily turning in equally impressive records in machine shops all over the nation. Why not ask our Field Representative to show how they can help increase your production—and profits, too.

® Reg. U. S. Pat. Off.







WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

ity is designed for the solution treating, age hardening, stress relieving and brazing of jet engine components.

Tubemaker Doubles Facilities

Uniform Tubes Inc., Collegeville, Pa., is operating its new plant No. 2, which doubles its manufacturing facilities. All tube drawing operations are being concentrated at the new mill. Facilities which handle additional special and rare metals have been incorporated and special heat treating equipment has been installed.

ASSOCIATIONS

National Industrial Advertisers Association, New York, elected these officers: Chairman, R. C. Sickler, E. I. du Pont de Nemours & Co., Wilmington, Del.; vice chairman, R. C. Myers, U.S. Steel Corp., Pittsburgh; vice presidents, M. S. Miranda, Dresser Industries Inc., Dallas; R. C. Christian, Marsteller, Rickard, Gebhardt & Reed Inc., Chicago; W. D. Crelley, Owens-Corning Fiberglas Corp., Toledo; A. R. Teifeld, Copperweld Steel Co., Pittsburgh; J. D. Wood, Jones & Lamson Machine Co., Springfield, Vt. Re-elected as secretary-treasurer is G. A. Frye, Doyle, Kitchen & McCormick Inc., New York.

Officers of **American Iron Ore Association,** Cleveland, are: Chairman, H. C. Jackson, Pickands Mather & Co.; vice presidents, H. S. Taylor, Oglebay, Norton & Co., and W. A. Sterling, Cleveland-Cliffs Iron Co.; treasurer, A. B. Rathbone, Oglebay, Norton & Co.; assistant treasurer, G. E. Guthery, Oglebay, Norton & Co. Staff officers are: President, F. G. Pardee; vice president, H. E. Johnson; secretary, Hazel M. Ronk; and assistant secretary, Lois M. Swaddling.

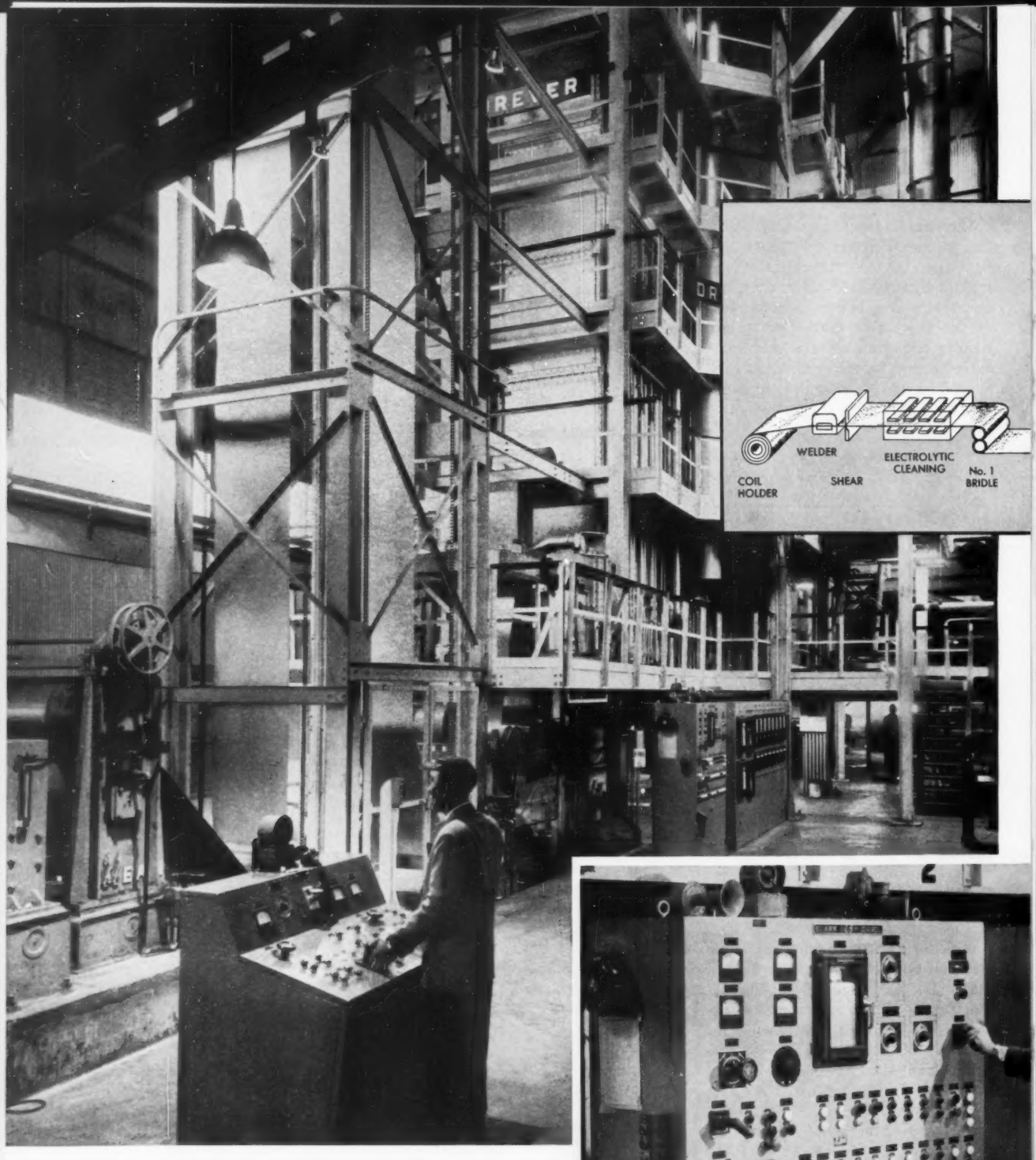
Malleable Founders' Society, Cleveland, elected these officers: President, P. C. DeBruyne, Moline Malleable Iron Co., St. Charles, Ill.; vice president, R. W. Crannell, Lehigh Inc., Easton, Pa.;

(*Please turn to page* 112)

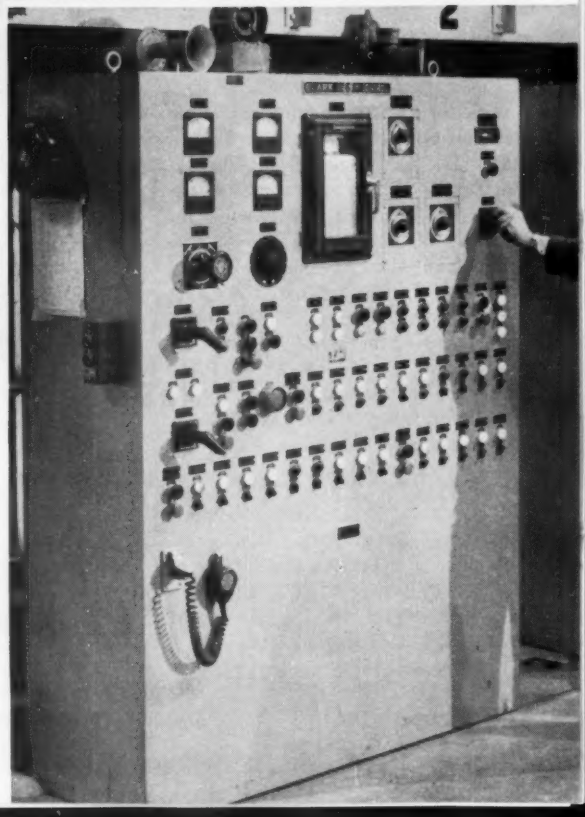
Conco engineered Cranes rate tops with **plant engineers** — for application engineering that is outstanding, for the service of trained field representatives, for unmatched quality that assures minimum maintenance, reduced accidents, increased output. Conco engineers draw on over 37 years experience to design for the age of automation. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.

FROM ANY VIEWPOINT
A FINER CRANE

CONCO ENGINEERING WORKS
Division of H. D. Conkey & Company 70-14th Ave., Mendota, Illinois
AFFILIATES: Conco Engineering Works–Domestic Heating Equipment • Conco Building Products Inc.,–Brick, Tile, Stone

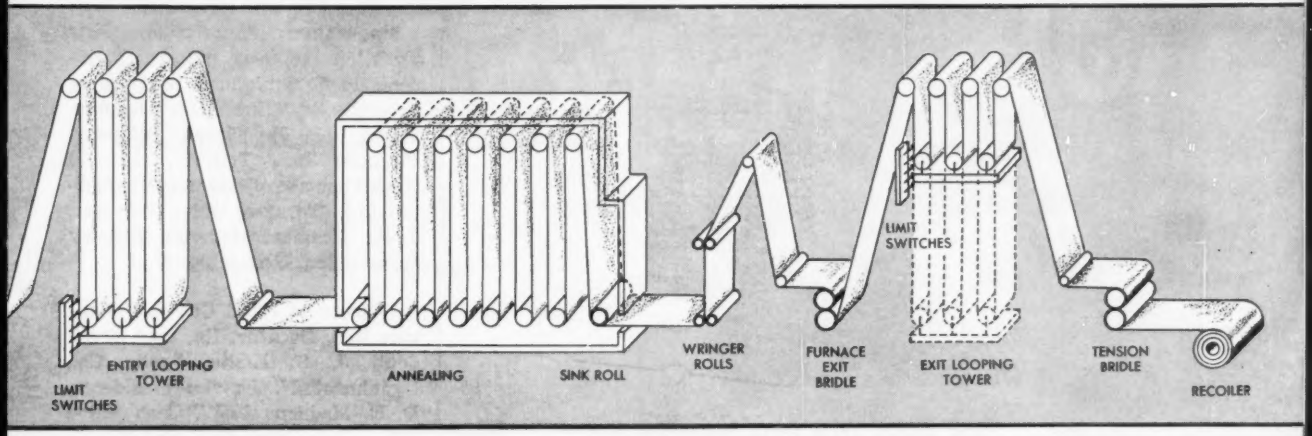


View of continuous annealing line from delivery end showing tension bridle, Clark operator's bench board, exit looping tower, cooling tower and Clark main control station.



Clark main control station for control of entire line. Various devices indicate operation of all sections from entry to delivery. Entire line can be started or stopped from this station.

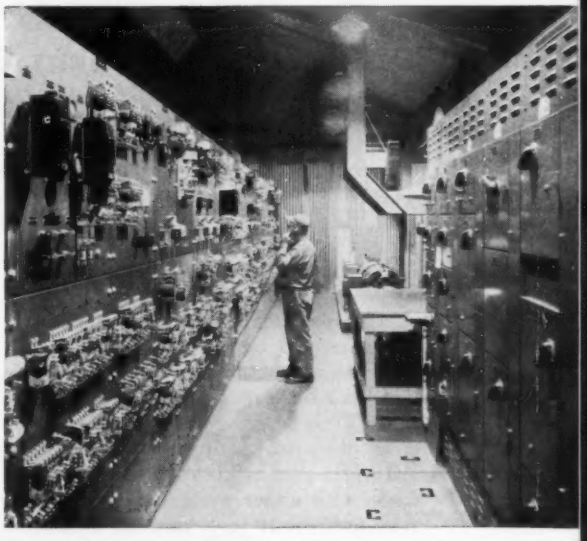
CONTINUOUS ANNEALING LINE at Empire Steel relies on CLARK for precise speed and tension control • • •



Empire Steel Corporation at Mansfield, Ohio is a leading producer of high-grade silicon electrical steel. To help meet the increasing demand for this product, the corporation recently installed a modern continuous annealing line.

A vital factor in maintaining Empire's high quality for this steel is the exact control of temperature, time and tension of strip in the annealing process. Completely equipped with Clark-engineered control, the line can maintain speed of strip through the annealing section to an accuracy of better than ± 1%.

The line is designed for continuous operation at speeds up to 180 fpm, and will handle strip up to 42 inches wide, 22 gauge and lighter. Two 60-ft. looping towers, one at each end of the annealing section, provide storage for coil changes and permit the necessary speed match of entry and delivery sections to the processing section. A total of 1600 feet of strip is required to thread the line (with both looping towers full)—1300 feet are in the line under normal operating conditions.



Remotely-located control room showing main Clark control panel at left, Clark control center at right for AC auxiliaries.

The Wean Engineering Company, who furnished the line propulsion and cleaning equipment, selected Clark to design and build the controls.

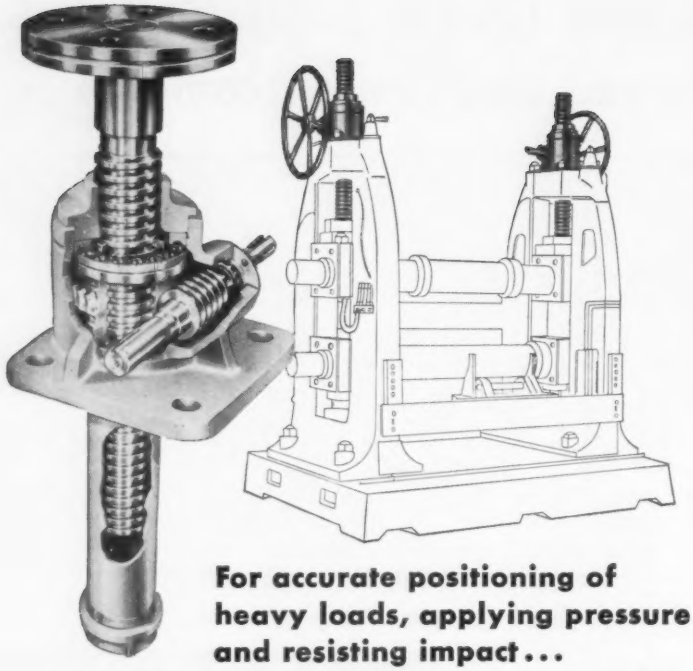
Clark also furnished the synchronizing and tie-in control equipment for the annealing furnace and looping towers supplied by The Drever Company.

The **CLARK** **CONTROLLER** *Company*

Everything Under Control

1146 East 152nd Street • • Cleveland 10, Ohio

IN CANADA: CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO



For accurate positioning of heavy loads, applying pressure and resisting impact...

Duff-Norton Worm Gear Jacks

Duff-Norton worm gear jacks provide a purely mechanical means for accurately positioning loads weighing up to several hundred tons and maintaining them indefinitely without creep. They may be incorporated into the design of a new piece of equipment, or installed in existing facilities to replace other positioning devices. They will operate in any position, and functioning as components of machinery or equipment, worm gear jacks can raise or lower loads, apply pressure, or resist impact.

Capacities range from five to 50 tons. When two or more are connected by means of shafting and mitre gear boxes to raise loads they lift in unison—even when the load is unevenly distributed. Worm gear jacks are available with standard raises up to 25 inches, and will maintain an exact raise through years of service without adjustment. Each of the six sizes has a standard worm gear ratio ranging between 6¾:1 and 32:1. They are made with either square or Acme threads, and give one inch raise for from 10 to 48 turns of the worm. Jacks are suitable for operation at ambient temperatures as high as 200°F.

Thousands of worm gear jacks are in use on feed tables, tube mills, welding positioners, pipe cut-off and threading machines, loading tables, rolling mills, conveyor lines, arbor presses and numerous other types of equipment. To learn how they can improve the performance of your equipment and save you money, write for bulletin AD-34-BB or ask for a Duff-Norton representative to call.

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(*Concluded from page* 109)

treasurer, Roy Willison, National Malleable & Steel Castings Co., Cleveland. Lowell D. Ryan was re-elected executive vice president and secretary.

Magnesium Association, New York, elected these officers: President, P. B. Craighead, Magnesium Products of Milwaukee; vice presidents, O. E. Grant, Magnode Products Inc., Trenton, O., and John Thomson, Dominion Magnesium Ltd., Toronto, Ont.; treasurer, J. V. Cosman, Superior Bearing Bronze Co., Moonachie, N. J.

Officers of **Fluid Controls Institute Inc.,** Decatur, Ill., are: President, J. S. Leslie, Leslie Co., Lyndhurst, N. J.; vice presidents, D. E. Madden, A. W. Cash Valve Mfg. Corp., Decatur, and M. B. Taft, Minneapolis-Honeywell Valve Division, Minneapolis - Honeywell Regulator Co., Minneapolis; treasurer, P. K. Rogers Jr., Skinner Chuck Co., New Britain, Conn.; secretary, E. J. Glinske Jr., Cochrane Corp., Philadelphia.

NEW ADDRESSES

Crucible Steel Co. of America, Pittsburgh, opened its new stainless steel sales office and warehouse building at 3400 Malone Drive, Chamblee (Atlanta), Ga. The firm also formally opened its expanded specialty steel warehouse at 4501 W. Cortland St., Chicago 39, Ill. D. K. Stuart is Crucible's new Chicago branch manager; E. K. Streeter, midwestern regional manager.

Whitehead Metal Products Co., New York, opened a 34,100 sq-ft warehouse in Windsor, Conn. Nonferrous and corrosion - resistant metals will be handled. Joseph C. Simmons heads the operation.

Loral Electronics Corp. moved to its new plant at 825 Bronx River Ave., New York 72, N. Y.

Aladdin Mfg. Co., manufacturer of tools, dies and stampings, moved to its new plant at 2979 Ontario St., Burbank, Calif. The facility increases the firm's production capacity 40 per cent.

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Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

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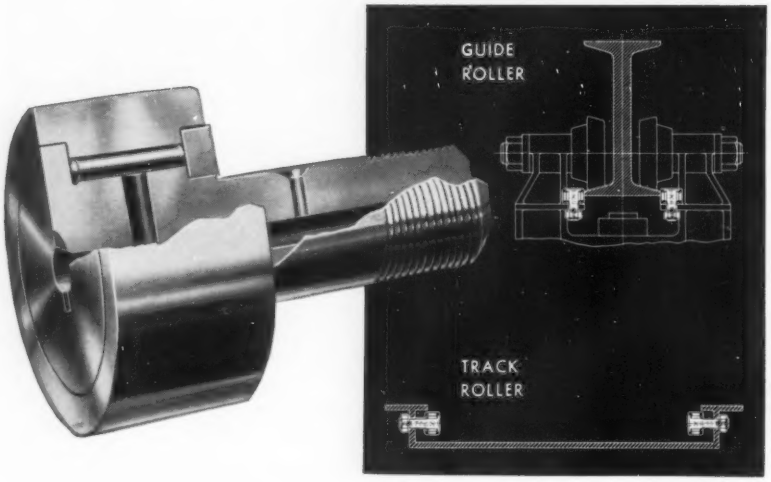
Stedman Foundry and Machine Co., Inc., Aurora, Ind.

BEARING TIPS by McGill

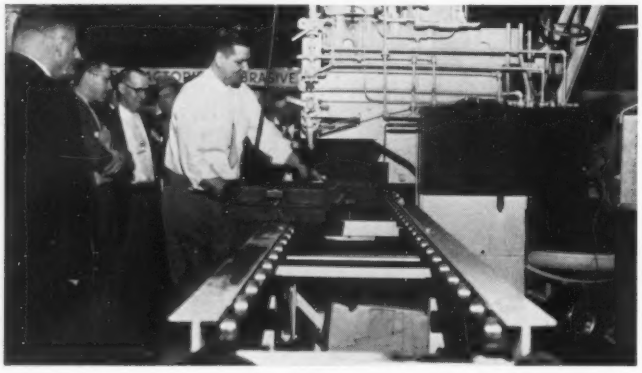
Let a CAMROL bearing be your guide



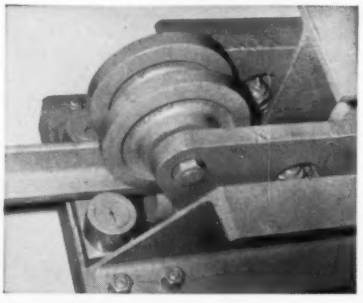
Obtain freer rolling, improved alignment and positive side thrust

In guide and support roller applications CAMROL Cam Followers insure free rolling action and positive side thrust while eliminating the wear of more costly flanged wheels. Then, too, they provide improved alignment and low starting and running friction with high unit load and shock capacity, especially at low speeds as track rollers. Lubrication is simplified and maintenance can be reduced to a minimum in these applications. Specify the interchangeable sealed SGR series for added protection against contamination.

CAMROL CF bearings provide friction-free track rollers for automatic mold blower



McGill CAMROL CF rollers are used as guide rollers to form a mold conveyor in the Beardsley & Piper MBS-20 Mold Blower. The machine blows and squeezes cope or drag in a single automatic operation, handling up to 4 molds per minute. The CAMROL CF bearings replaced less efficient friction rollers in this application. Although, the duty here is rather light and speeds slow, the cam follower bearing provides lesser starting and running friction. This helps speed the flow of work from the machine, which must be fast and automatic. The integral stud feature eases assembly and its standard design simplifies procurement.



CF bearings minimize maintenance as crane side guide rollers

McGill CF cam follower bearings serve as side guide rollers in overhead cranes manufactured by Louden Machinery Company of Fairfield, Iowa. Freedom from maintenance, a time saver because of the inaccessibility of the bearing when the crane is in operation, is an important advantage of the cam follower bearing.

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McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

STEEL

June 24, 1957

Technical Outlook

NEW PROBLEMS— The development of high strength, heat resistant materials for the hot airplane is only the start. Turning them into parts and assemblies will cause a revolution in manufacturing methods, predicted H. B. Sipple and G. G. Wald, Lockheed Aircraft Corp., Burbank, Calif., at the San Francisco meeting of the ASME. Forming will require increased machine capacity and higher temperatures. Explosive forming will be used to form parts of high strength metals which cannot be made any other way. Because the tougher materials machine at a slower rate, machine tool requirement of the aircraft industry may have to be expanded four to tenfold. There will be more welded structures. Heat treating distortion and corrosion are other problems.

SELF-REDUCING TUNGSTEN—Electro Metallurgical Co., a division of Union Carbide Corp., New York, is marketing a new soluble tungsten alloy for steels containing from 0.060 to 18 per cent of the metal. Called self-reducing tungsten, the alloy contains an agent that reduces tungstic oxide, yielding tungsten directly to the melt. Electromet says the alloy goes into solution rapidly and yields a high recovery and uniform distribution of tungsten.

RIDE TO GRIND— Slab grinding at the Brackenridge, Pa., plant of Allegheny Ludlum Steel Corp. is being done by hydraulic-electric machines which move up and down the length of the slab on rails. An operator rides the grinding car, manipulating the controls. It's faster and more efficient than swing grinders, according to the company. The steady grinding pressure produces a slab surface that results in a smoother, more uniform surface on the finished stainless sheet.

FREIGHT ON WHEELS— That's the effect of a scheme for transporting big Westinghouse transformers as an integral part of the railroad car. A car consisting of two separate double-truck platforms will support end sections of a web truss. The end sections hook onto the transformer case, which becomes the center truss member, so that the effect is of a drop center railroad car. The equipment adds an additional 2 ft of height clearance and can handle units weighing 500,000 lb.

CHEAPER BY THE PART— You can look for more magnesium in diecastings for tomorrow's autos. One of the Big Three just completed a study which compared the light metal with those in use. Although basic material cost is higher, it machines faster, die wear is less and it's much cheaper to ship.

TOOL TEST— A production lathe in the isotope laboratory at the General Motors Technical Center uses a radioactive (tungsten 187) sintered carbide cutting tool to study wear. Test particles from the tool which transfer to the cutting fluid and to the metal chips are detected by a gamma ray scintillation counter. Experiments indicate that variability in cutting tool material and workpiece may have greater effect on tool life than certain combinations of workpiece, speed and tool feed. Advantage of the method, say GM researchers, is that it is possible to determine tool wear in "minute" increments along a tool's total life, compared with conventional tests which measure cumulative wear occurring in relatively large increments. Tool break-in wear can also be studied.

Metalworking Outlook—p. 67 *Market Outlook—p. 157*

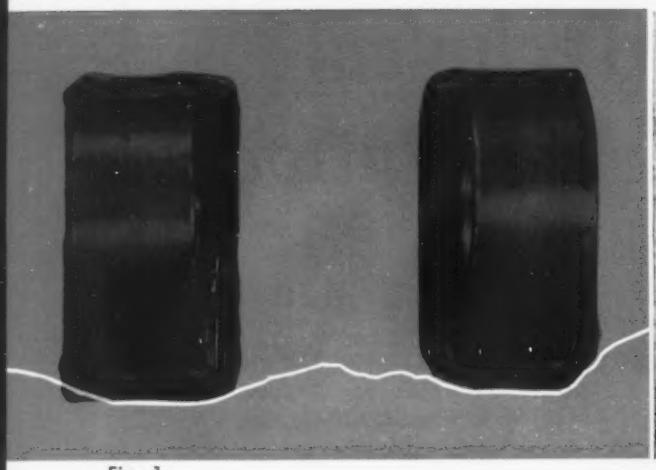


Fig. 1

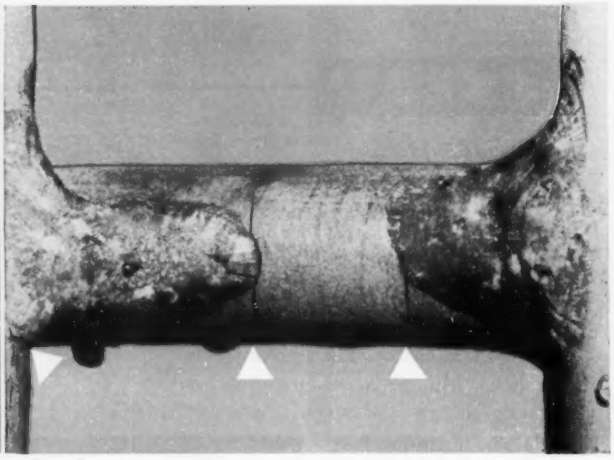


Fig. 2

Stress concentrations at the toe of fillets (Fig. 1) caused this fatigue failure. Solution: Concave fillet weld blended into base metal. Cracks at the edge of tack welds (Fig. 2) were caused by a combination of cyclic stress and pickling attack. Wires are part of a basket made of Type 347 stainless

How To Avoid Trouble with Stainless

Cracks and failures are caused by combination of hidden notches, stress concentrations and corrosion with stress and surface contaminants like carbon, zinc and sulphur. Here's how you can spot them

PART I

FABRICATORS and users of stainless steel parts usually find that weld failures are due to one or a combination of these flaws:

1. Notch effects in unfused butt joints, the edges of convex weld beads or similar changes in section.
2. Stress corrosion.
3. Surface contamination.

Such causes are often hard to identify. Here are some tips that will help you track them down.

Causes—Welding isn't the sole culprit. Many failures are caused by stress concentrations (part is overloaded) or by fatigue (cyclic loads).

Austenitic stainless steel welds are particularly susceptible to cracking when they are residually or externally stressed in contact with corrosives—particularly hot chlorides.

Surface contamination with zinc or sulphur is particularly harmful.

Notch Effect—This is the most frequent cause of mechanical failures. They stem from design more often than they do from welding practice. Frequent oversights: Failure to specify joint preparation, size, penetration, contour and finish. It's a good rule not to leave such details to the discretion of the welding shop.

A fillet weld with an improper contour in a critical corner can start serious notch effect. An example is shown above (Fig. 1). Two wristpin bosses are welded to a thick diaphragm made of Type 304 stainless steel. The diaphragm is oscillated rapidly by a crank and pin which engage the bosses.

The crack appeared in a short time. The failure was diagnosed as a fatigue crack which initiated at the toe of the fillet weld beads. The unit may have been designed for dynamic stresses across the joint which were well below the endurance limit. But the contour of the fillet beads was flat to slightly convex, concentrating considerable stress at the toe. The cyclic stresses exceeded the endurance limit, and a fatigue fracture resulted.

You can avoid the problem by making fillet beads with a concave contour and blending the toe into the plate surface.

Corrosion Stimulator—Another example of failure by notch effect and stress concentration is illustrated in Fig. 2. Pickling baskets made of tack-welded Type 347 crosswires began to develop fine

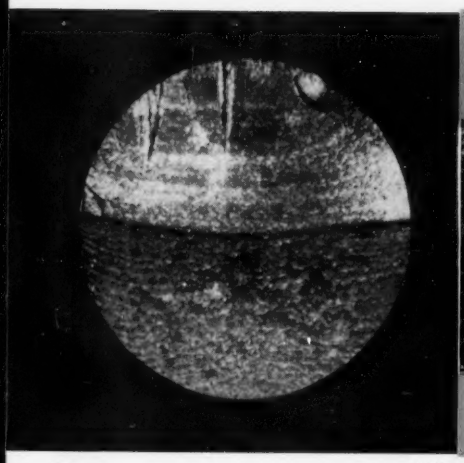


Fig. 3 X15

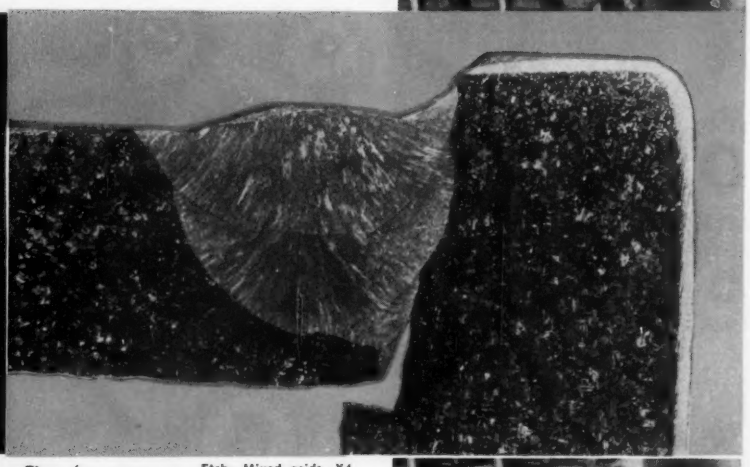


Fig. 4 Etch: Mixed acids, X4

(Fig. 3)—Cross section of fractures in Fig. 2 looks like this. Oyster-shell marks and steps (upper half) are characteristic of fatigue fractures. Lower half is deliberote break. Incomplete fusion of welding roots leaves notches (Fig. 4) which collect corrosives and are stress concentrators. Avoid joints like this

Welds

By GEORGE E. LINNERT
Research Welding Metallurgist
Armco Steel Corp.
Middletown, O.

cracks at the toe of the weld beads. When the wire section was broken through a crack, the pattern was characteristic of fatigue.

The baskets were carried by a chain conveyor which gave them a jouncing ride. Dynamic stress was concentrated at the toe of the weld beads, causing fatigue cracks. Pickling solution on the surface probably hastened the failure, since the corrosion lowers fatigue strength.

It isn't advisable to resistance spotweld the basket wires because such joints are susceptible to fatigue cracks which start in sharp crevices between members. Woven wire baskets are reasonably free from notch effect and stress concentration.

Incomplete Fusion — A more dangerous form of notch is shown in Fig. 4. A corner between Type 304 plates has been welded from the top side. The designer apparently called for a single bevel with a small root face on the horizontal member and a machined step or ledge on the vertical one. He may have wanted a weld which would leave only the horizontal abutting surfaces unfused.

A precision fitup is difficult in practice. In the example, the horizontal member moved away from the ledge about 1/32-in. in two directions. The first bead didn't penetrate and bridge the root gap, so a notch about $\frac{1}{8}$-in. long remained. Two beads filled the groove, making the weld thickness about $\frac{3}{8}$-in.

Under shock or cyclic loading, notch is a major factor in the strength of the joint. Stress at the notch root could easily be two or three times the applied load as ordinarily computed.

Fast Solution — The causes of mechanical failures often seem obscure. Most cases can be quickly solved by looking for notch effects —including unfused notches, improper weld bead contour and excessive weld reinforcement.

Fractures caused by dynamic stresses probably seem like fatigue failures. If fatigue fracture characteristics are absent, the weldment possibly was subjected to overload or impact loading. Rotating equipment like shafting, mixer blades, and tumbling drums require great care to avoid notch effects that invite fatigue failure.

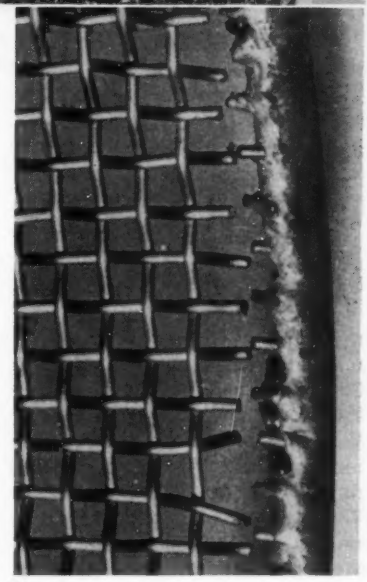
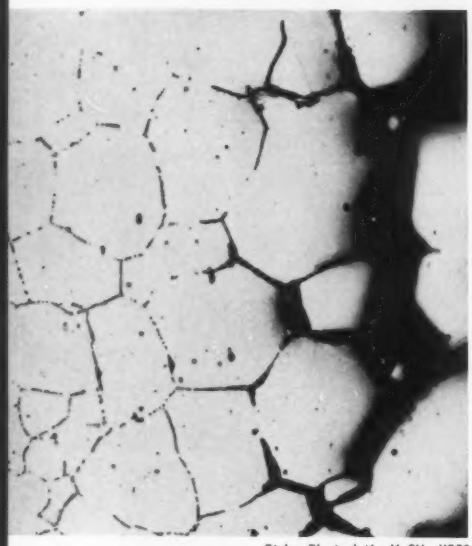


Fig. 5

Welding precipitates carbides in the zones adjacent to the weld. Result: Intergranular corrosion. Pickling solution ate through these wires

Corrosion — Stress - corrosion cracking, not intergranular attack, is the most frequent cause of failure in stainless steel weldments used in corrosive environments. Users don't see many cases of corrosion failure; they sometimes have difficulty in interpreting an attack.

Fig. 5 is a typical case of intergranular attack. It is a pickling basket made of Type 304 stainless steel which has been sensitized by



Etch: Electrolytic NaCN, X250

Fig. 6—This is an example of intergranular corrosion of Type 304 stainless. Attack via grain boundaries, which contained precipitated carbides, detaches whole grains

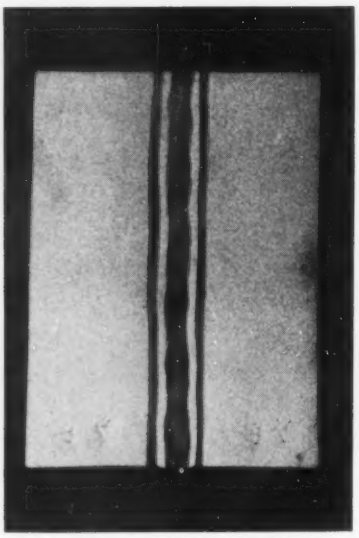


Fig. 7—Fast quenching is futile if you're trying to avoid intergranular corrosion from precipitated carbides, says the author. Sample (Type 304) was etched with hydrofluoric acid

welding heat. Metallographic details are shown in Figs. 6 & 7. Chromium carbides have precipitated in the grain boundaries a short distance from the weld. This zone was heated to the sensitizing range between 800 and 1600°F. The corrosive damaged the material by rapidly and selectively attacking the grain boundary area, detaching whole grains.

Failures from intergranular corrosion occur infrequently now that fabricators and users are alert to the danger. There are three dependable methods to control sensitization:

1. Postweld solution annealing treatment.
2. Stabilization of the steel with columbium, columbium-tantalum or titanium (as in Types 347 and 321).
3. Use of grades with an extra-low carbon content (examples, Types 304L and 316L).

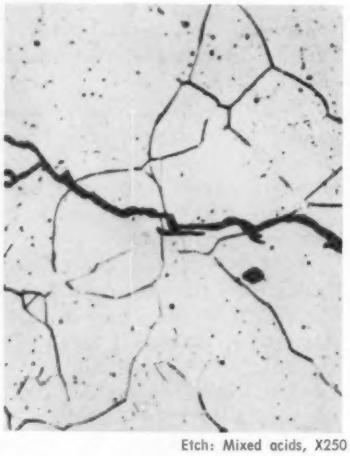
Occasionally, a fabricator will be tempted to try a short cut like fast quenching with air or water. A look at the temperature distribution or isotherms along a welded joint will show that sensitization takes place in the base metal beside the arc and crater. No amount of accelerated cooling will eliminate the carbide precipitation.

Stress Corrosion — Some commercial stainless steels are susceptible to this kind of cracking. Two factors, when present simultaneously, promote failure in austenitic stainless steel: Tension stress and certain corrosive solutions, especially those containing chlorides.

This type of cracking stems from seemingly harmless combinations of stress and environment. Service stress alone may be far below yield strength, and environment alone may produce no corrosive attack under normal conditions. Yet under the combined influence of stress and corrosive solution many cracks start and grow.

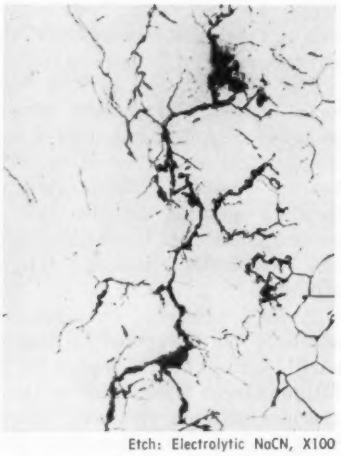
Identification—The location and appearance of surface cracking like that in Fig. 8 sets it apart from intergranular corrosion, but it will not serve to positively identify the failure as stress-corrosion crack-

Fig. 8—Boiling in magnesium chloride revealed stress-corrosion cracks in the Type 304L weldment. Metallographic examination separates it from intergranular corrosion



Etch: Mixed acids, X250

This is how a typical stress-corrosion crack (like that in Fig. 8) looks under the microscope. The metal is austenitic chrome-nickel stainless. Careful examination avoids confusion



Etch: Electrolytic NaCN, X100

In this example, both stress corrosion and intergranular attack are taking place simultaneously. This stainless was sensitized by the heat effects of welding

ing: Metallographic examination is necessary.

In parts which have failed, the cracking usually propagates transgranularly and generally is characterized by fine, many-forked branches. Austenitic stainless steel in the sensitized condition can exhibit an intergranular form of stress-corrosion failure. Stress-corrosion cracking can still proceed transgranularly even if intergranular attack occurs at the same time.

The stresses imposed by service loads seldom enter into the problem. Residual stresses induced by cold forming and welding are the more common causes of this defect. Any austenitic stainless weldment in the as-welded condition contains residual stresses of a level near the yield strength of the material. The only practicable method of removing the stress is by annealing or stress relief. Cooling the treated weldment from a high temperature must be done carefully to avoid new stresses.

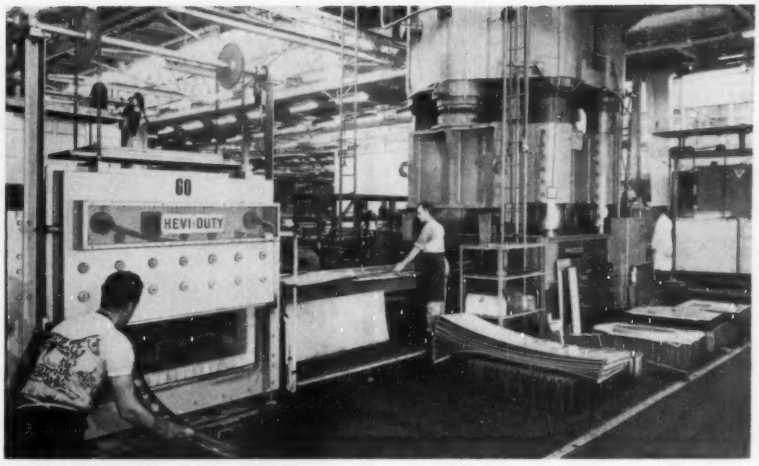
Remove Contaminant—Changing the environment is sometimes the remedy. Chlorides or other compounds may be only a contaminant which can be eliminated.

A notorious cause of stress-corrosion cracking is the residue from soldering fluxes. Occasionally, an austenitic stainless weldment is soldered to close a vent or attach a nameplate. Flux residue may contain a large percentage of chlorides. Unless it is properly rinsed, it can play a leading role in stress-corrosion cracking.

Crevices formed by notches and overlapping surfaces are also troublesome. They can foster crevice corrosion and provide a starting point for stress-corrosion cracking.

Weld metal in austenitic stainless often displays more resistance to stress-corrosion cracks than base metal. The explanation: Free or delta ferrite in an austenitic weld structure. Further, any ferritic grade of stainless steel, whether weld or base metal, is not susceptible to stress - corrosion cracking.

• *An extra copy of this article, and Part II which appears next week, is available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



Operator is putting titanium part into the portable furnace. At the bench, a heated part is being placed in position for forming in the hydraulic press

Portable Furnace Heats Titanium

Easily moved to the area where it is needed, the unit is used primarily to heat parts for hydraulic press forming. It's also used in the drop hammer department

MARTIN CO., Baltimore, needed a furnace that would heat titanium and hydraulic press form blocks efficiently. The unit had to be portable, so it could be moved to the work area where it was most needed.

The job was given to Hevi-Duty Electric Co., Milwaukee. The furnace they built has a chamber that is 24 in. high, 50 in. wide and 72 in. deep—big enough to handle form blocks and parts up to 36 in. wide and 54 in. long. The chamber is divided by a removable, alloy steel screen shelf mounted 8 in. from the bottom.

The double end furnace can be worked from either end by transfer crews in production runs.

Integral—All controls are built into two cabinets on the side of the furnace. A recirculating air fan, built into the top, turns off when the doors are opened. This protects the operator and minimizes the heat drop within the furnace.

The bottom of the furnace is reinforced with welded structural steel beams, and a pair of rubber-tread, metal wheels is mounted on each corner.

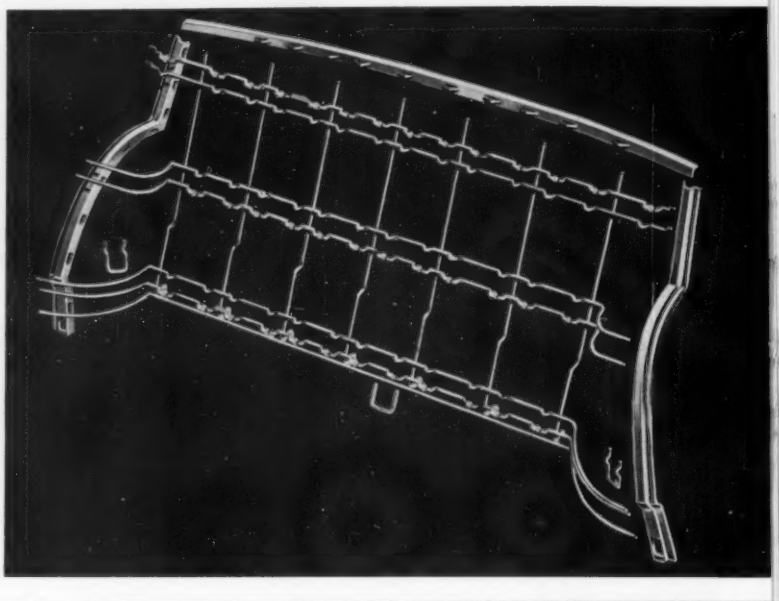
Heating Elements—The furnace has to heat up quickly to maintain a constant temperature while the doors are open. (During a run, they are opened every 5 minutes.)

Return bend heating elements are mounted on the six interior sides of the furnace, including both doors. The doors are vertically operated by air cylinders.

Uses—In the drop hammer area, the furnace has a limited use for titanium details that cannot be resistance heated because of their irregular shape. Its primary use is in the press area where steel form blocks are preheated and transferred to the press table. Detail parts are heated at the same time and placed on the blocks for forming.

The furnace also is used for the stress relieving of finished titanium parts.

Seats and seat backs in 1957 Chevrolets are made largely of welded wire. Advantages: Lower costs, more resiliency, better quality. Here's an account of how it's being done by Fisher Body Division



New style seat back frame is joined by resistance welder

How GM Replaces Stampings with Wire

THE seat back frame at the left (above) is used in the 1957 Chevrolet. It's an example of how wire can replace more complicated stampings like those in the old style frame at the right.

Here's how John Cantalin, engineer, Fisher Body Division, General Motors Corp., described the development before the American Welding Society at Cleveland.

Old Style — Auto seat frames support S-shaped springs, which are covered with border wires, pads and trim material.

The old style frame was made from stampings spotwelded together. Retaining seats for the S-shaped springs were formed in the sheet metal. Early models had retaining ears for coil springs.

Change — To make the frames lighter and more resilient, Fisher Body substituted individually formed wires for many of the sheet metal parts. Loops are formed to retain the S-shaped springs.

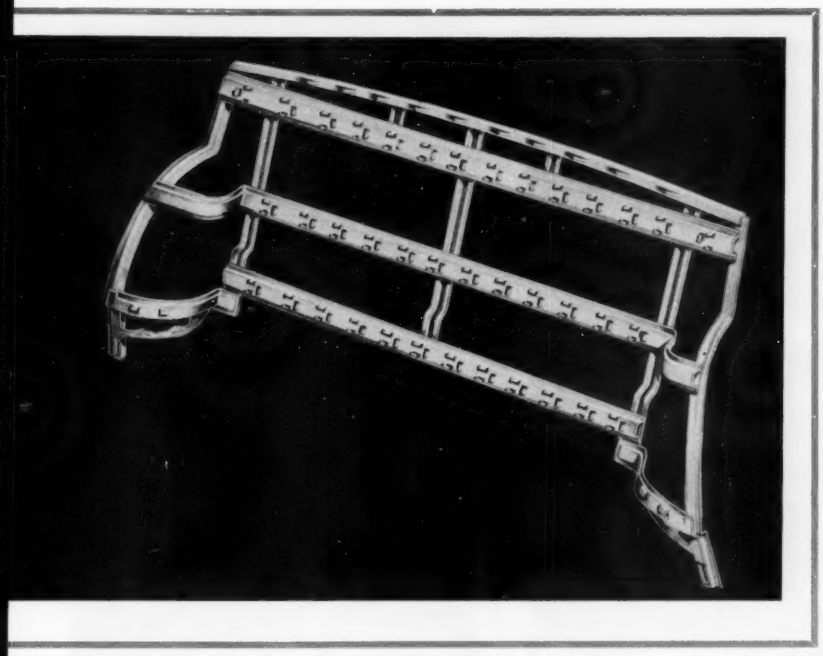
The assembly is joined by two types of resistance welds: Cross-wire and wire to sheet metal. Both are forms of projection welding.

The wire-to-wire type is one of the simplest and easiest projection welds when both wires are round and the same size. Location of parts isn't critical. Electrodes can be plain flat tips. Welding range is relatively large. About the only critical requirement is electrode pressure follow-up, which is within the range of most welding guns. Theoretically, said Mr. Cantalin, there is only point contact between the two wires at first; it is necessary to follow the set down of the metal as it heats.

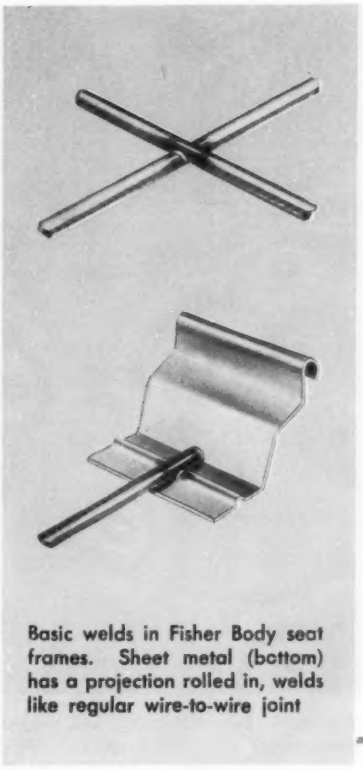
Wire-to-sheet metal welds can be troublesome. Fisher Body forms a projection in the sheet metal to concentrate enough heat in the sheet without overheating the wire. That makes the wire-to-sheet metal weld like the wire-to-wire type.

Assembly Details—Before forming, the seat back wire frame is called a wire mat. It must be uniform within close tolerances. Accumulation of error from one wire to the next or in over-all length can't be tolerated.

Fisher Body developed a special purpose welding machine which is



Old style seat back frame was made entirely of stampings



Basic welds in Fisher Body seat frames. Sheet metal (bottom) has a projection rolled in, welds like regular wire-to-wire joint

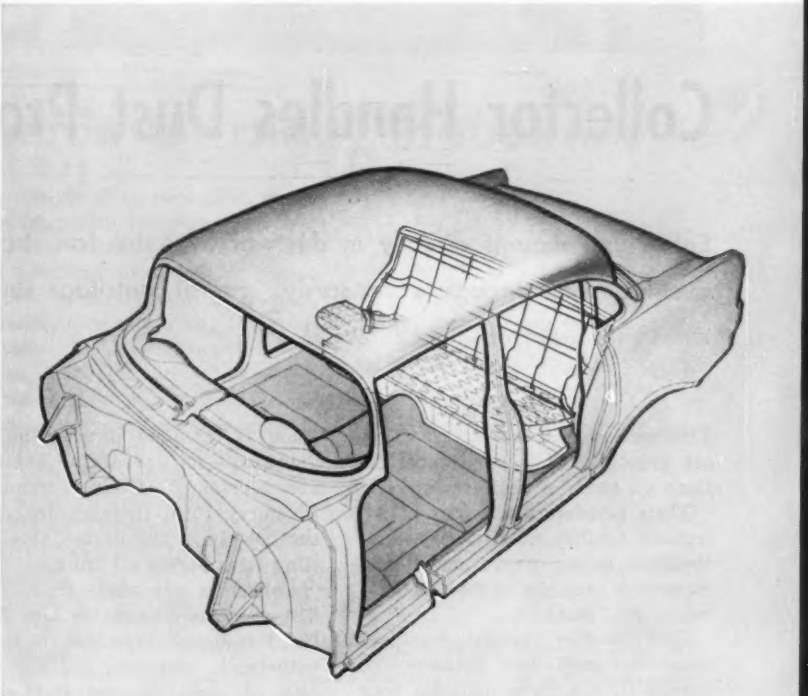
completely automatic. Wire from reels is fed into the machine, straightened, welded, sheared and ejected onto a conveyor. The flat wire mats pass through a series of conventional die operations.

The dies also form the loops for retaining the S-shaped springs. Forming the mats eliminates handling individual wires. Uniformity pays off in the bending and forming operations.

The formed wire mat is welded to a few detail wires and sheet metal parts. Wire-to-wire and wire-to-sheet metal welds are completed in assembly fixtures by conventional multi-spotwelding machines.

The seat is ready for installation after assembling these items to the frame: S-spring, border wires to align them, pads and trim.

That is only one of many such examples, says Mr. Cantalin. Auto body development rests heavily on resistance welding, he feels, and co-operation of design, manufacturing, tooling and welding engineers is paramount to further progress through that kind of redesigning.



This is a phantom view of a Chevrolet body which shows the location of the rear seat back frame

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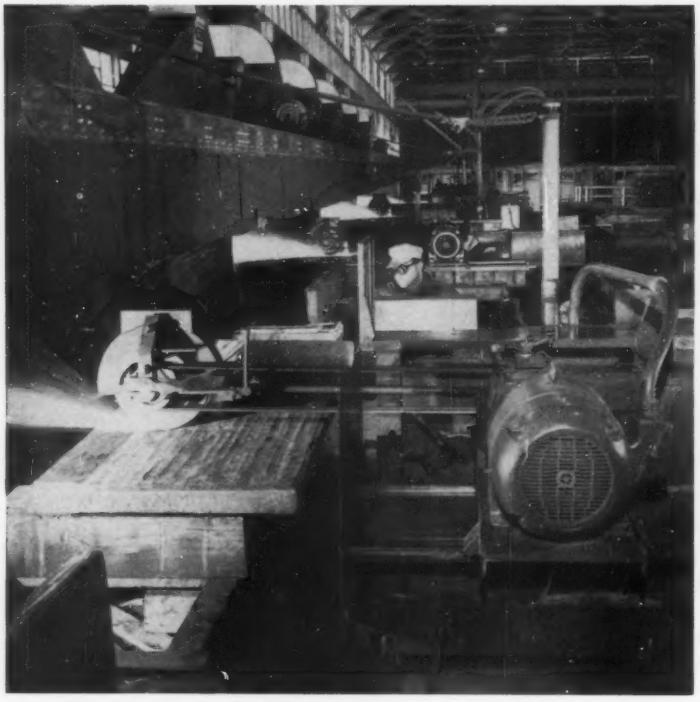
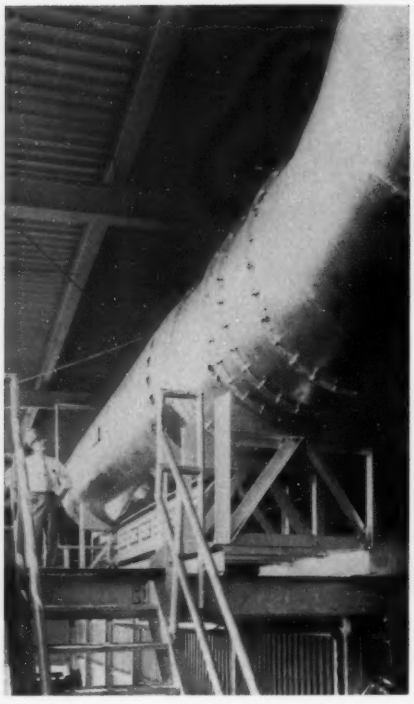


Workmen operate hydraulic-electric grinders—source of Allegheny Ludlum's dust problem. Slabs get a more uniform surface for final rolling



This is the cylindrical dust collector. It does not require separate cabinet

Collector Handles Dust Problem

Entire unit mounts directly in ductwork. Axial fan draws dust-laden air through water spray. Spiral centrifuge separates the dust from the water

THE workmen in the picture above are grinding off surface imperfections on slabs of stainless steel.

Their grinders are a part of Allegheny Ludlum Steel Corp.'s multimillion dollar improvement and expansion program at its Brackenridge, Pa., plant.

Control—The seven machines create a large dust problem. To handle it, the firm installed four dust collectors, each of which handles 48,000 cfm of air.

The units (see page 147) use axial fans, a spiral or centrifugal collecting network and a water spray to separate dust from air. Each is installed directly in the ductwork—no separate cabinets are necessary. Dust is removed in slurry form through drains in the bottom of the units. One settling tank serves all units.

Collectors are made from Type 316 stainless. The maker, Joy Mfg. Co., Pittsburgh, says that the metal withstands corrosion and the erosion of abrasives and steel dust. Units are especially designed for minimum maintenance.

Question—One of the major problems involved the need for a separate dust collector for each grinder. E. J. Hochdanner, works engineer at Brackenridge, reports: "We are able to move more than enough air with four units. The three units we saved cut our installation expense considerably."

Grinders — Allegheny Ludlum feels that motorized billet grinders are faster and more efficient than the old-style swing grinders. Speed and efficiency formerly depended on the workman who held the counterbalanced wheel against the steel.

The new wheels are electrically driven and are mounted on a boom which is controlled hydraulically. It's a combination which gives more uniform control. The improved surface of the billets is said to be responsible for better stainless sheets, fewer rejections.

The grinders are mounted on rails. The operator rides the car and controls the progress of the wheel across the slab.

Dravo opens new Research Center in Pittsburgh

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- How can thick, low-grade oil be burned in a space heater?
- Can "growth" be prevented in sinter machine grate bars?
- Can rudder design improve towboat maneuverability?

Finding answers to these and hundreds of other problems is the job of research teams at Dravo. The partial list of products and services shown below suggests how unusual the task is. It involves almost every industrial field: construction, steel, chemical, petroleum, power, marine and many others. It is concerned with practical problems of materials and methods, equipment performance, quality control and cost reduction. It includes studies that may be of specific interest to you.

An issue of our publication, Dravo *Review,* describes these activities and the new Research Center where much of this work is performed. May we send you a copy? Write DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

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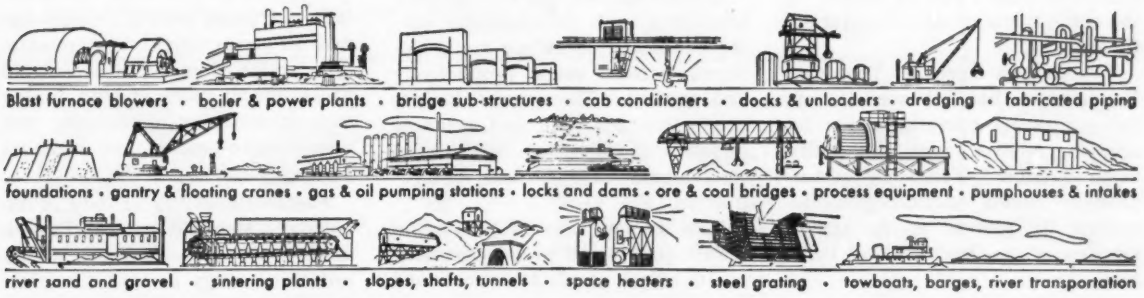
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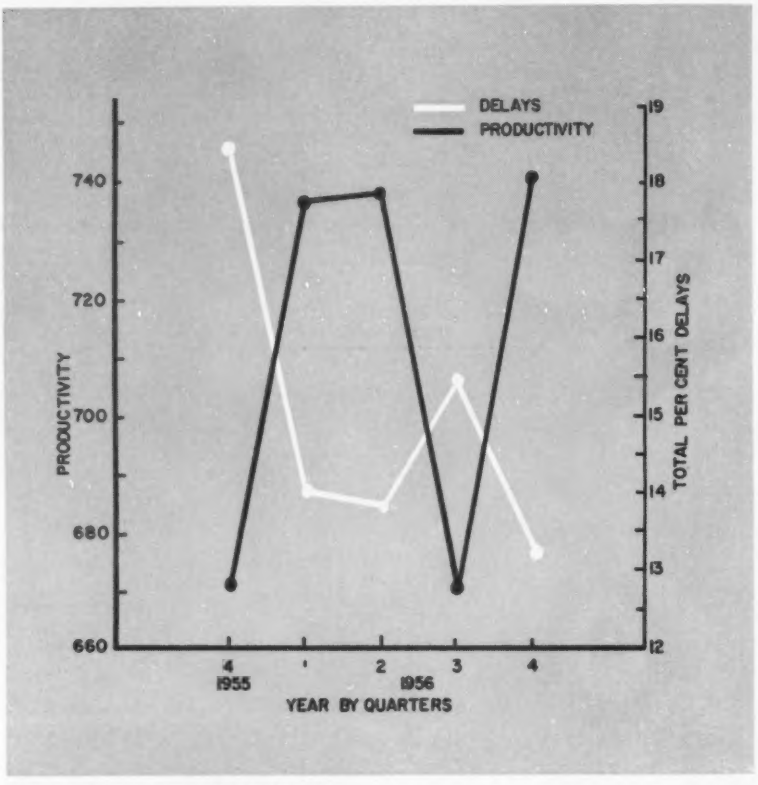


Delays Down; Productivity Up

Fig. 1.—Productivity and delays vary inversely on the continuous sheet pickler

Continuity Control for Management

Costs go down; quality and productivity go up when the record shows why and where delays occur. Here's how a major steel company improves its continuity of production

STEELMAKING has an answer to the cost-price squeeze: Greater efficiency.

Youngstown Sheet & Tube Co., Youngstown, has improved the efficiency of its operating units by applying what it calls "continuity of production." Walter T. Hayter, process control metallurgist, described the system at the annual meeting of the Iron & Steel Institute.

Continuity—On any continuously producing unit, interruptions during scheduled operating hours adversely affect costs, productivity and quality. They result in less production per man and machine hours worked, which is reflected in a higher cost per unit of production (Fig. 1).

How discontinuity of production lowers quality can be demonstrated by its effect on electrolytic tinned strip for tin cans. The Youngstown unit produces tin plate in coils which are welded end to end to form a continuous ribbon. Delays result in overpickled plate, excessive tin coating weight, burned, stained and damaged plate.

Another Example—Coiler delays on a hot mill result in cobbles, scrapped slabs, poor surface and undesirable physical properties.

Discontinuity of production also can disrupt schedules in the customer's plant. Material scheduled for rolling at the time of delays is often by-passed and must be rescheduled. Material rejected for offquality due to production difficulties requires reordering and rerolling and delays shipping. Broken promises are long remembered by a customer.

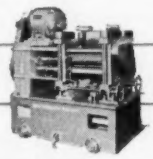
Causes—Delays generally may be attributed to one of four major causes: Mechanical, electrical, operating or outside (Fig. 2). Most time will be lost due to recurring delays such as bearings or spindles in the mechanical group, motor problems in the electrical group, changing rolls in the operating group and power failure in the outside group.

The balance of lost time in each group consists of many small, recurring and nonrecurring delays. The major groupings are useful to alert those responsible for preventing delays. Youngstown finds a detailed breakdown under each major classification is necessary for the analysis of delay causes.

Reports—Production and delay reports are issued by each turn and crew on each major unit. Each delay, if not categorized by the recorder, must be placed in the proper group and further classified.

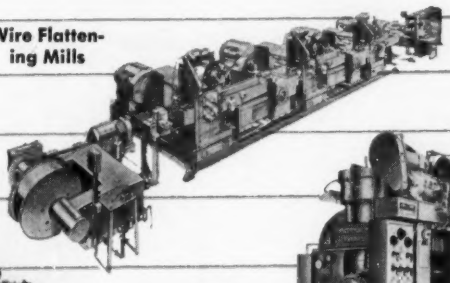
Other reports are issued by the inspection and metallurgical departments. They provide the basis for determining the effect of delays on quality and performance. Accounting department records provide figures on productivity, costs, product mix (which often can be considered an assignable cause of both quality and productivity variations) and unit, slab-to-product and ingot-to-product yields.

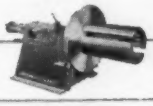
Facts—Reliability of data is important. Men may have to be educated in the use of detailed, standard terminology so that the prob-



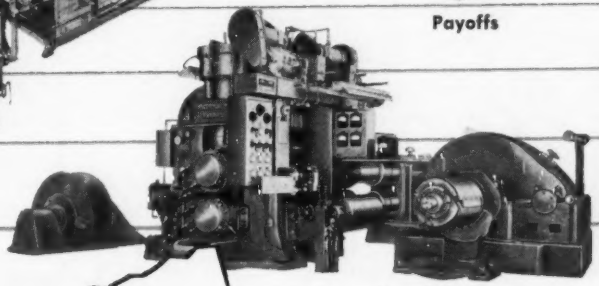
Coilers

Wire Flattening Mills

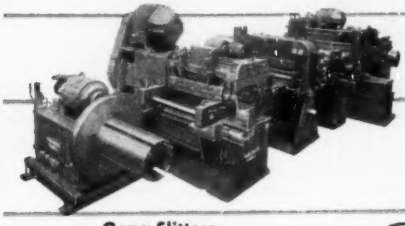




Payoffs



Two High Strip Rolling Mills



Gang Slitters

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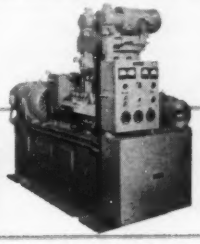
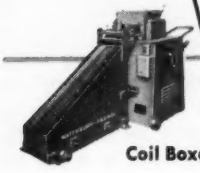
Re Rolling Mill Modernization

Look Into Latest Waterbury Farrel Mill Machinery



Four High Strip Rolling Mills



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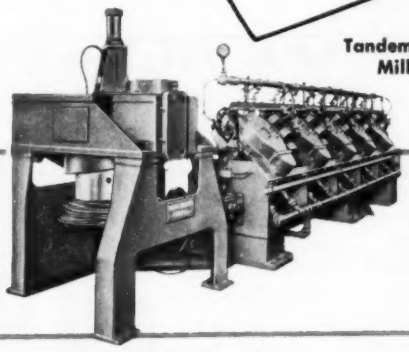
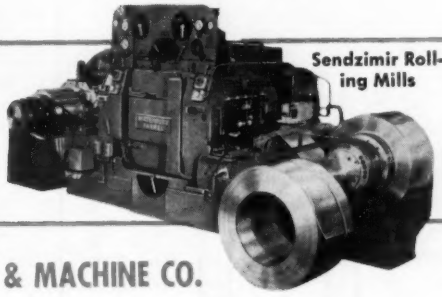


Tandem Rod Mills



Sendzimir Rolling Mills

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Mint Mills
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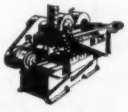
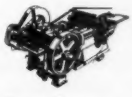


Bolt, Nut & Screw Machinery



Power Presses

Rolling Mill Machinery

Wire Mill Equipment

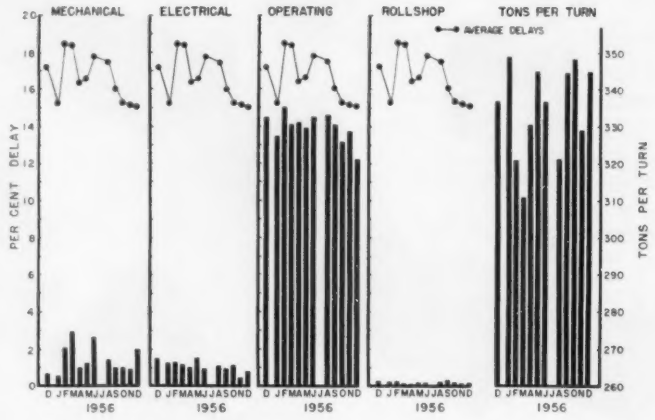
Sendzimir Mills & Other Special Machinery

lems can be systematically recorded for analysis.

Too often, one type problem can be called several things, or what appears to be several problems may be only one. An example is a delay attributed to "bad steel." The material may have been cracked or spongy or have burned edges. A delay attributed simply to "mechanics" or "rolls" may not give the section of the unit and details of the mechanical trouble or the type and location of roll changed.

Norms—With a background of information, simple statistical methods are used to predict expected variations in delays and the percentage of defects. Norms and units of performance to guide supervisory personnel are arrived at. Crew, unit and department competitions are set up. They include such things as delays, percentage increases in productivity and increases in yields.

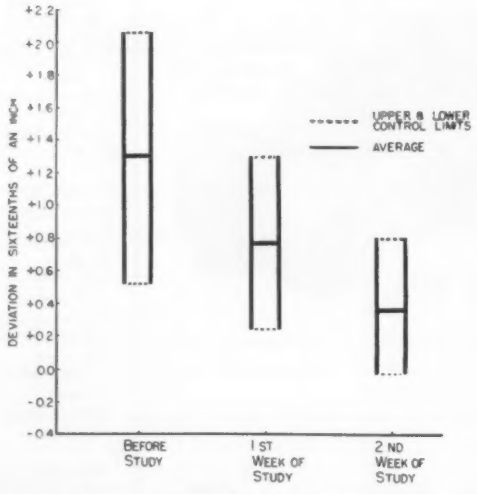
The company finds that much can be achieved by information skillfully presented. Competition between groups is encouraged in the belief that most men take pride in their work and none wants to be at the bottom of a comparative list (Fig. 3).



Charting Shows Trouble Spots

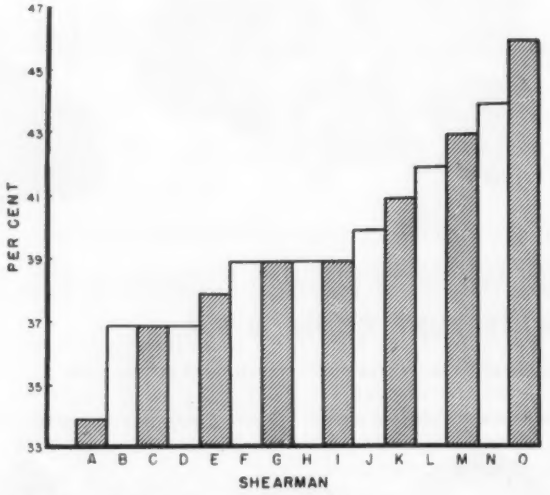
Fig. 2.—Sources of delays on a 5-stand mill and how they affect productivity

O.K. Products—The mill issues periodic "O.K. Product Reports." Their purpose is to encourage production. The "O.K." portion of the product does not include any rework or extra handling, such as straightening pipe or sorting tin plate. No distinction is made ex-



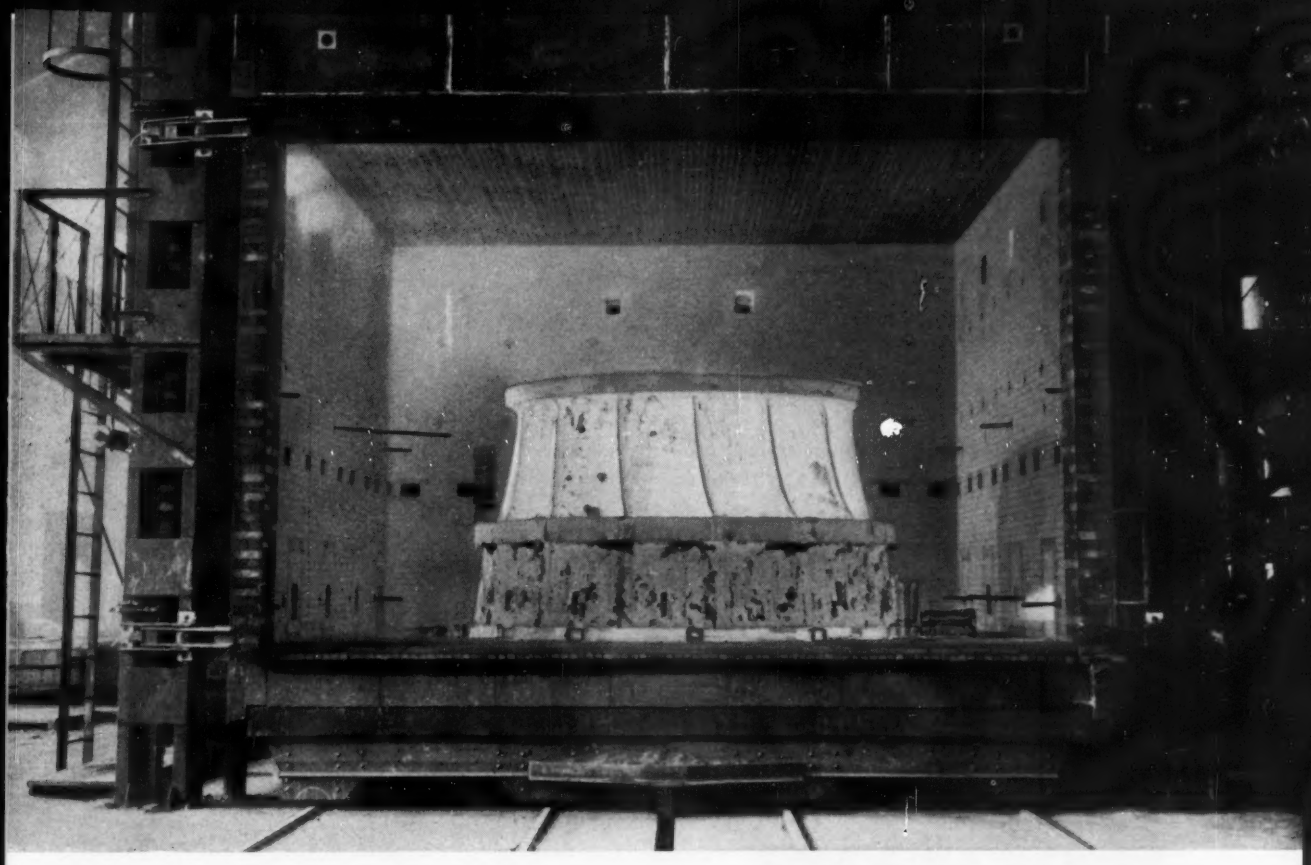
When Men Know, They Can Improve

Fig. 3.—Cutting control on the flying shear drum improved after results were shown to shearmen



Worker Efficiency Varies Widely

Fig. 4.—Place for improvement: Prime tin plate recovered from the reject piles of different shearmen



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Engineering a furnace lining with *specialized* refractories can save dollars on construction, fuel and maintenance as well as extend productive working time. To achieve these results, seven different B&W refractories were used in the lining of this 25′ x 23′ x 14′ annealing furnace.

Fuel savings and close temperature control were made possible by using three types of *lightweight* B&W Insulating Firebrick. Walls are composed of *B&W K-23 IFB* backed up with *B&W K-16*. Because of the proximity of the burners, the roof was constructed of *B&W K-26 IFB*, a higher temperature brick to guard against the effect of possible localized overheating.

The weight saving construction means about 100 lb less refractory material to heat up per sq ft than with ordinary firebrick, or about 28 tons less in the roof of the furnace. Furthermore, supporting steel is less massive, far less costly. Commercial size steel can be used for roof suspension instead of special steels.

To eliminate the need for expensive special shapes, the burner tunnels are formed of *B&W's 3000 F refractory castable, Kaocast*. Lintels over the burners and jambs are constructed of rugged *B&W Junior Firebrick*.

To take advantage of fast, easily installed castable construction, *B&W Kaocrete-D* was used in the nose arch (separately pictured). This sturdy castable with a 2500 F use limit was selected to provide strong resistance to abrasion caused by door operation. In addition, the need for costly fired shapes and their supporting castings was eliminated, as was a great deal of expensive engineering detailing.

Nose arch, cast of B&W Kaocrete D, immediately after removing forms.

The car top is insulated with *B&W Kaolite-20*, a 2000 F insulating refractory concrete.

For further information, write for B&W bulletin R-2-H on insulating firebrick and B&W bulletin R-35 on castables.

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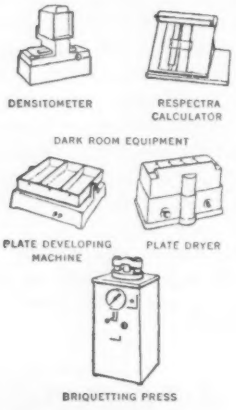

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CONTINUITY CONTROL . . .

cept to differentiate between "O.K." and "N.G." (no good).

One O.K. report classifies electrolytic tin plate after shearing this way:

1. Percentage which may be shipped directly to the packaging department.
2. Percentage held for one or more defects.
3. Percentage diverted to the reject piler, including material with holes, coil ends and scrap.

Held Lifts—In addition to general classification, the company keeps records on sources of defects causing "held lifts." Held lifts are charged to steel (e.g., laminations); hot strip mill (e.g., scale); cold reduction (e.g., gage); and electrolytic tinning lines (e.g., unmelted plate).

As a result of competition the percentage of "O.K." plate rose from 64.1 per cent in 1954 to 67.1 per cent in 1955 and 67.7 per cent in 1956. In the last half of 1956, it rose to 70 per cent.

Inform—The company has saved a lot of money in recent years by informing the shearmen and operators of their results. Fig. 4 indicates the difference in the ability of several shearmen to reject a minimum number of prime sheets in the reject piler. Any decrease in the amount of prime plate mistakenly classified will automatically increase the percentage of O.K. plate, entailing no further handling costs.

Another type of report concerns coils which are rejected before processing on the next unit. They are analyzed for cause and charged back to the producing unit. Other O.K. report adaptations are used throughout the mill, reflecting quality and quantity being produced.

Comparisons—Information gathered daily and weekly is summarized in a monthly report on quality, productivity, delays and yield progress. Graphic comparisons between crews indicate causes and effects of delays, trouble spots and particular problems. Each department head and the foremen under him receive a complete text, plus all charts pertaining to their operation and a general picture of yields throughout the plant.

Copies of the monthly report covering all units are distributed to

The Luster that Sparked Lower Costs

Photos, courtesy of Jensen-Thorsen Corporation, Forest Park, Illinois

How the
HOUSE OF STAINLESS
Helped Manufacturer Save Time and Money through a Switch in Stainless Finish

In manufacturing their line of stainless steel sinks, Jensen engineers were confronted with polishing problems resulting from the deep draws involved in fabricating the product. Searching for the right answer, the CSS sales representative brought in a metallurgist from the House of Stainless. After reviewing the production picture, it was suggested that Jensen continue using Type 430 stainless, but switch to a high-luster finish at no increase in material cost. Tests soon proved the soundness of the change. Production time has been cut substantially. Fewer polishing operations are now necessary to provide the lasting luster that meets the high standards at Jensen.

Here's another case where a seemingly small change makes a big difference in results—production-wise and cost-wise.

That's why it pays to draw on the knowledge of the House of Stainless for metallurgical assistance. You'll get the help you need. If your requirements can be satisfied from warehouse, our stocks of stainless steel in any size, shape or form, are among the most complete in the midwest and you can count on prompt delivery. If your production calls for mill shipments, our mill placement department can handle your requirements through the leading stainless producers in the country.

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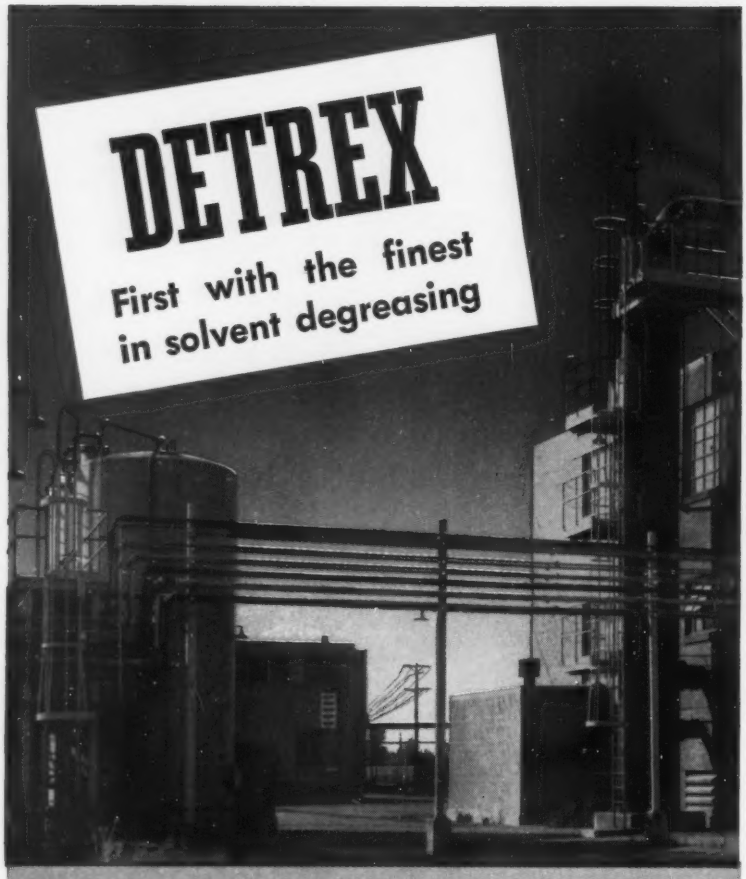

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CONTINUITY CONTROL . . .

general superintendents, district managers and the vice president in charge of operations. The most important feature of this report is that it provides a complete interpretation of the month's results, compared with previous like periods, and makes a complete picture of process variables available to everyone from the vice president to the foreman.

Divisions—The monthly report is divided into two major sections: One covers the steel plant and primary mills; the other includes all flat rolled products. Some items are reported in both, such as steel problems that affect flat rolled products and ingot or slab-to-product yields.

A semiannual report summarizes problems and important factors shown in monthly reports and has the same distribution. Its main value is to provide long range information and to indicate changes not noted or not clear in other reports. Results of projects and special studies are included. The report has been found valuable in appraising new equipment, installations and methods.

At the end of each quarter, the company also issues an analysis of complaints received during the period. They are broken down by source and type and are compared with records of previous periods.

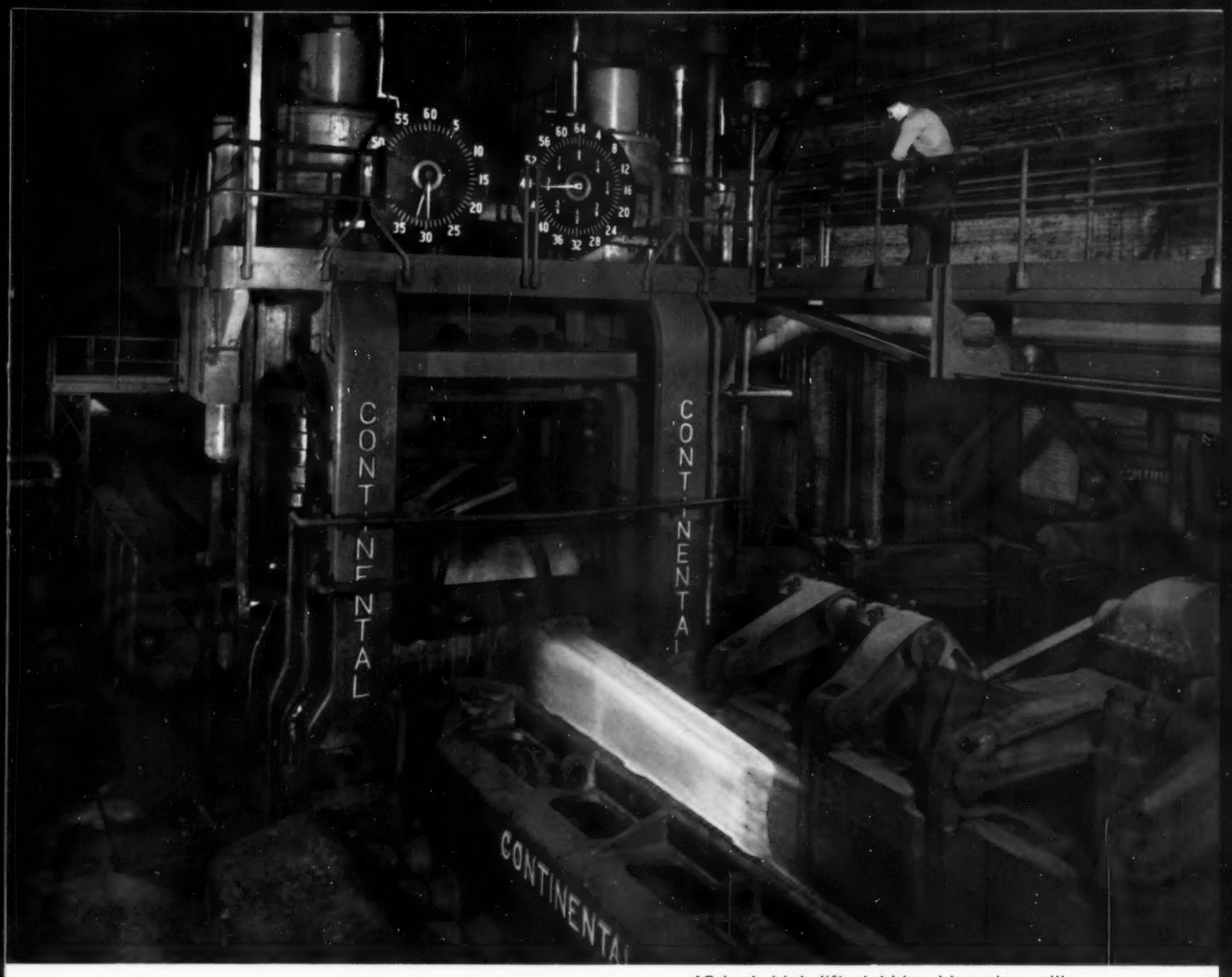
Graphic — The company makes great use of graphic presentation: Bar charts, histograms, curves. Charts requiring attention are duplicated in red and those deserving commendation in green. Narrative interpretations of trends, excess variation and tabular or nonrecurring data are also circulated.

Reports are published by the sixth of each month. Superintendents see the written and graphical data prior to publication and are free to enter comments in the text. (They are enclosed in brackets and identified by source.)

Semimonthly and monthly yields, delays and man-hours per ton are posted on display boards.

Maintenance—One result of the studies has been a preventive maintenance program. Inspections of mechanical and electrical components are regularly scheduled. Com-

(*Please turn to page* 133)



46-inch high lift slabbing-blooming mill

BLAW-KNOX SLABBING-BLOOMING MILLS

Blaw-Knox designs and builds slabbing-blooming mills in a complete range of sizes in high-lift and universal types. Other Blaw-Knox equipment for metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

The Continental Billet Conditioning System provides straight through work flow from raw billet inspection to chipping and discharge

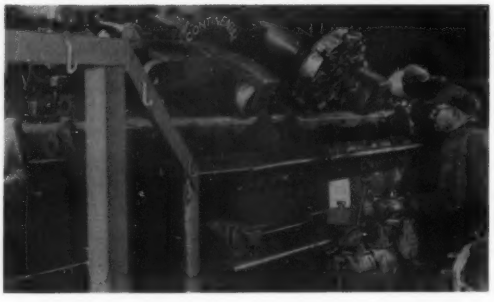
BLAW-KNOX Billet Chipper

increases chipping production, cuts handling time

The Blaw-Knox Continental Chipper with auxiliary equipment is a complete mechanical system for unscrambling or sorting bundles, inspecting and chipping billets. This integrated system has demonstrated in-service cost savings over manual conditioning. It represents a wise investment in long range modernization programs for conditioning for subsequent rolling in merchant and bar mill operations.

Product quality improvement is immediate, positive. Precise chipping is accomplished by a non-traveling cutter head under which the billet moves in a fashion similar to a milling machine. All chipping is done at close range, immediately in front of the operator. This single operator, located in front of the cutter head controls the entire operation including all material handling.

The chipper is equipped with special interlocking devices which eliminate unsafe operation.



Usual chipping bay hazards such as high pressure air lines, improperly handled chisels, and flying chips are removed. The Continental Chipper accommodates billets up to 30 feet in all merchant and bar mill sizes.

BLAW-KNOX

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CONTINUITY CONTROL . . .

plete records cover service, inspection and action taken on recommendations made by servicemen and inspectors.

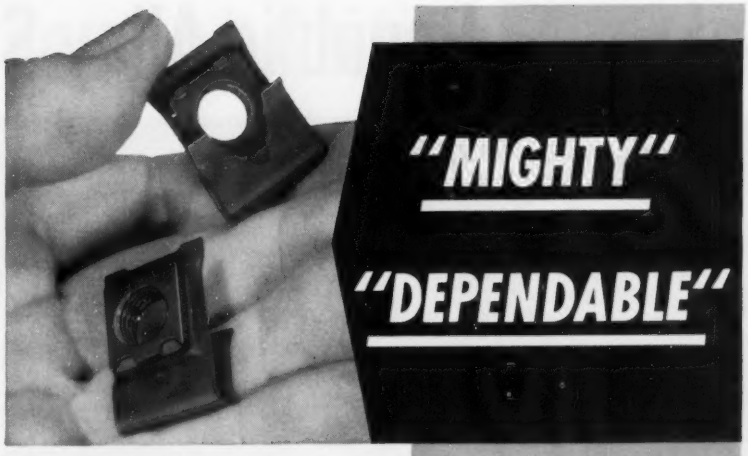
For such a program to be effective, good records are a must. Take the example of what happens when a 900-hp, hot strip mill motor fails. Including lost production at a down time cost of $8000 per hour for 120 hours, the repair bill would come to $966,120. However, if $8000 worth of parts were carried in stock (as determined by records indicating what parts are likely to fail) down time cost could be reduced to $72,800. An even more spectacular saving could be realized by making a preventive overhaul during scheduled down time at a cost on only $1200.

Changes — Another result has been the correction of ill-conceived or outdated practices. Equipment such as automatic gages, recording micrometers, temperature and continuity controls has been introduced to provide more accurate and useful information. Types of grease have been changed as a result of keeping track of bearing delays; selection of rubber rolls has been improved as a result of roll delay analysis on the electrolytic tinning lines; lubricity of rolling mill solutions has been varied because of strip surface studies.

Better control of annealing furnace variables and lower tap-to-delivery time from the open hearths to blooming mills have resulted from control studies. Fewer delays have meant higher productivity and yields, better quality and better knowledge of the causes of complaints.

The program has caught the interest of management and employees at lower levels. They now realize how undue variations at other stages can affect their own operations. The charts and reports are the basis for daily, weekly and other periodic meetings—an opportunity to obtain suggestions for corrective measures. In addition, upper levels of management are provided with graphic information for use in making decisions.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



PRESTOLE STAKE NUTS

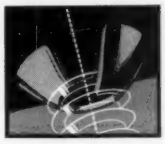
• EASE and SPEED OF ASSEMBLY
• GREATER STRENGTH and HOLDING POWER

Looking for extra strength and more dependability in a fastener for metal panels and parts?

HERE'S THE ANSWER . . . the improved Prestole Stake Nut. Hundreds of fast assembly applications that are subjected to heavy service and vibration, such as automotive parts, are ideal for this Prestole engineered fastener.

Hand applied—it quickly locks into bolt-receiving position over the panel hole, utilizing the formed catches on the lower leg of the clip. The unit is ideal for blind location attachments.

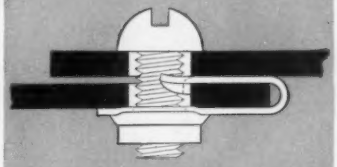
Prestole Stake Nuts are available in various multiple thread sizes and panel ranges, and in finishes to meet specifications.



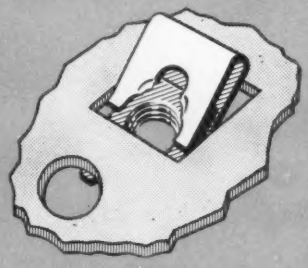
Creators of the famous Prestole impression "that lasts." Standard and special fasteners to meet specific requirements.

. . . used in high speed assembly of metal parts and panels

1 EDGE FASTENING



2 CENTER PANEL ASSEMBLY



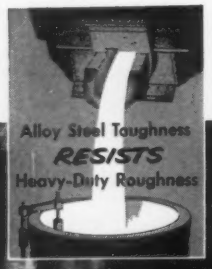
PRESTOLE Corporation
1306 MIAMI STREET, TOLEDO 5, OHIO
PRESTOLE CORPORATION OF CANADA, LTD., OAKVILLE, ONTARIO

Please send engineering application data for the following specifications:

SCREW SIZE..... PANEL RANGE ..... HOLE LOCATION .....
Application.....
Name.....Title.....
Company.....
Street.....
City.....Zone.....State.....

TRY THEM FOR HEAVY-DUTY APPLICATIONS

Republic Alloy Steel Provides



UNDERGROUND—Republic Alloy Steel's super toughness and strength help the 14-BU Loader perform with exceptional ease. This machine, made by Joy Manufacturing Company, Pittsburgh, Pa., helps to increase the per-shift tonnage possible from operations in low coal.

ON LAND—Republic Cold Finished Carbon Corrected Steel provides dependability for track pins used in the Oliver Corporation's "OC-18" Crawler Tractor. Years of service on other Oliver models have proved this material to be exceptionally resistant to fatigue failure, and able to absorb the shocks and wear of the most rugged service. Cold finishing improves ultimate strength, yield point, and hardness. Carbon correction saves money by restoring the surface the carbon lost in hot rolling and by eliminating need for the removal of this low carbon surface. Production economies are effected by taking advantage of the straightness, smooth surface, accurate size, and excellent machinability of Republic Cold Finished Steel. Mail the coupon for more information.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Super Toughness at Critical Points in Modern Mining Equipment

Today's modern mining equipment is capable of digging and moving tons of coal simply by flicking a switch or pulling a lever. Essential to the economical and dependable operation of these marvelous machines are Republic Alloy Steels.

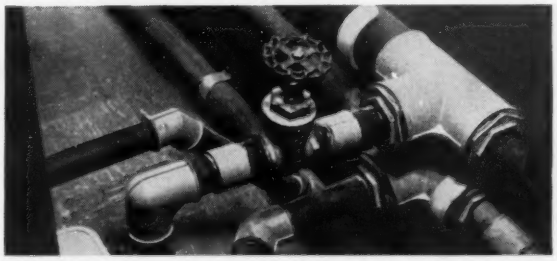
These finest of steels provide equipment producers, such as Joy Manufacturing Company, with the high strength, toughness, shock-resistance and abrasion-resistance values needed to withstand the severe service to which the machines are subjected.

By using Republic 4340 and 4620 Alloy Steels for shafting in the 14-BU Loader, Joy engineers have reduced the possibility of mechanical breakdown to an absolute minimum. These fine steels offer superior toughness and strength to withstand torque, fatigue, shock, and stress. Alloy steel's uniform response to heat treatment gives these shafts hard surfaces around tough cores providing maximum resistance to abrasion, friction, and wear.

In Republic Alloy Steels you will find the highest strength values—plus an exceptionally high strength-to-weight ratio that permits the designing of thinner sections to save weight and hold down size without any sacrifice of needed strength.

Specify Republic Alloy Steels to insure safety, to extend equipment life, to cut maintenance and replacement costs. Specify Republic Alloy Steels where strength and toughness must resist heavy-duty roughness. Our metallurgists will help you apply these fine steels to your product efficiently and economically. The coupon is your invitation to their services.

IN THE AIR—Titanium saves 400 pounds gross weight in pod applications alone on the Boeing B-52. Bell Aircraft Corporation fabricates the jet engine pods for this history-making global bomber from titanium supplied by Republic and other producers. Titanium offers the highest strength-to-weight ratio of construction metals. It was selected for this application because of its lightness, strength, and corrosion-resistance. This resistance to corrosion makes Republic Titanium extremely attractive for processing-applications. It is immune to salt water and highly resistant to most acids. Send coupon for more facts.



IN WATER or chemical carrying lines, tough, lightweight Republic Plastic Pipe practically eliminates pipe replacement costs. Blaw-Knox solved a cooling tower re-piping problem by switching to Republic SRK after other pipe material failed in a year or initial costs proved too high. Use of Republic SRK provided substantial savings in material, installation and replacement costs. A similar job, installed three years ago, shows no sign of damage or wear. Republic SRK is easy to carry, easy to install, non-toxic, immune to sunlight. The coupon will bring you complete facts.

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☐ Have an Alloy Metallurgist call.
Send more information on: ☐ Cold Finished Steels ☐ Alloy Steels ☐ Titanium

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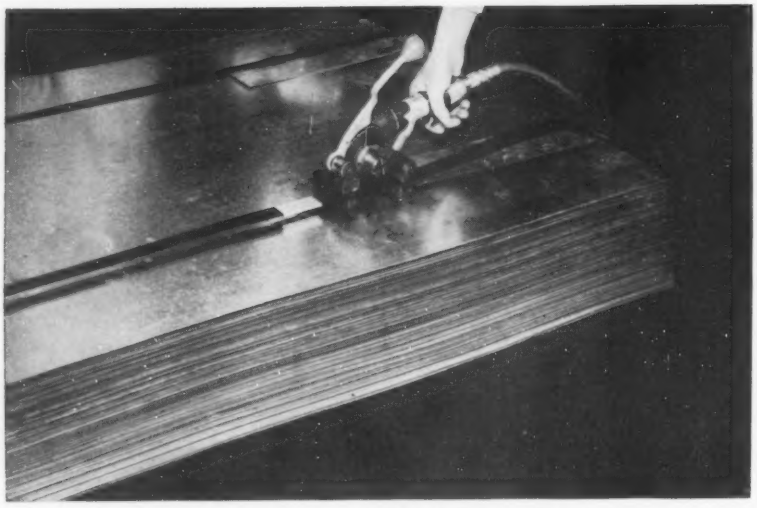

Tension strapping a bundle of sheets with the PNC stretcher-cutter

Steel Packaging Costs Studied

BRAINARD Steel Strapping Division of Sharon Steel Corp., Warren, O., has launched a program aimed at reducing handling and packaging costs in steel mills.

An advisory service is included. Specialists may be called to advise steel mill management on the most economical methods of packaging and handling.

Strapping Tool—Research and development of new packaging tools is another part of the program. To launch its retooling project, the division has announced a heavy-duty strapping tool, the air-powered PNC stretcher and cutter.

The machine operates on any flat stock or package, tensioning and cutting heavy duty strapping on pallets, skids, car bracing and large bundles. It weighs only 12 lb, making it easy for one man to handle.

Rented—Brainard will rent the tool to users of heavy-duty straping for $100 a year.

Coincident with this announcement, the division opened a new production line for heavy duty strapping at its Warren plant. The facilities can process more than 2000 tons of strapping a month, twice previous capacity.

SELECT A Sterling THAT FITS YOUR JOB!

TUBULAR STEEL FRAME

(Above)
Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right)
Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog

12 SPOKE STEEL WHEEL

PNEUMATIC TIRED WHEEL

IMMEDIATE SHIPMENT

WOOD HANDLE BARROW

DEALERS: Want to sell quality wheelbarrows? You can on our non-exclusive basis. Write for details.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

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Casting Titanium

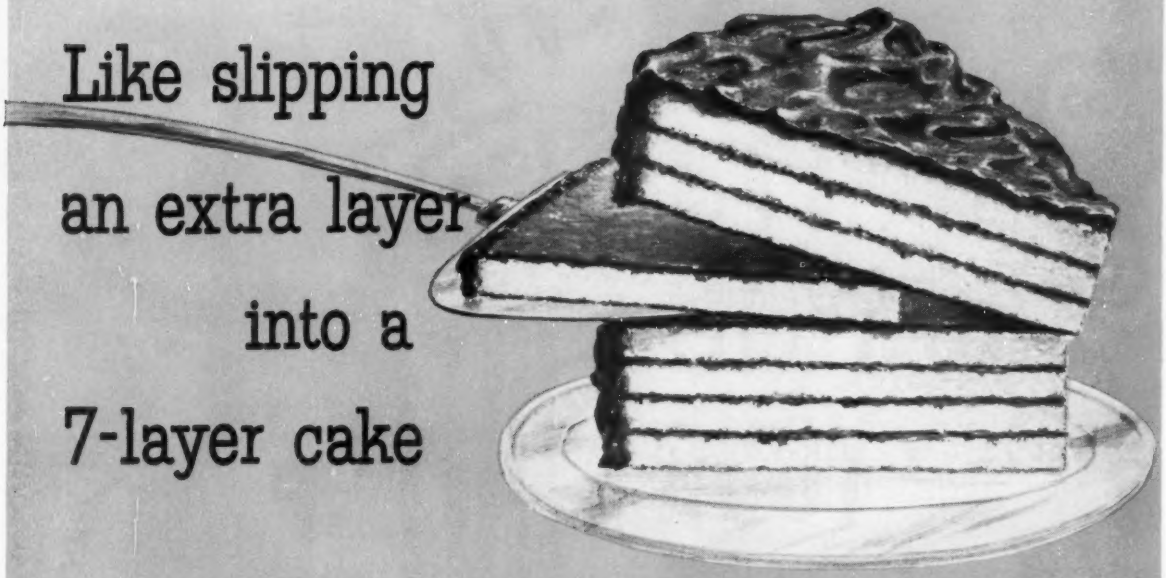
OREGON Metallurgical Corp., Albany, Oreg., is operating a consumable electrode furnace that will produce titanium and zirconium castings in the pure state or alloyed with aluminum, vanadium, tin, chromium, manganese and molybdenum in almost any combination. Its capacity: 100 lb.

In the liquid state, both metals react with every known element except argon and helium. So the mold must be contained in the melting furnace. (Water-cooled copper and graphite molds are used.) At the end of the melting process, the furnace and mold are rolled over, pouring the metal into the mold.

Castings of 125,000 psi tensile strengths have been produced, and higher tensile alloys are being developed.

Titanium's strength-to-weight ratio and corrosion resistance make it valuable for a wide range of applications. Zirconium has a growing potential as a structural material in atomic power reactors because of its low rate of absorption of thermal neutrons and its resistance to corrosion at reactor temperatures.

Like slipping an extra layer into a 7-layer cake



TIGHT QUARTERS

at Curtiss-Wright's South Bend plant (Utica Bend Division) created a rough installation problem. McGraw mechanical erection men had to fit in heavy-tonnage machinery for overhauling jet engines, but the ceiling was too low for conventional crane operation, and the plant had no overhead crane. To solve the problem, the McGraw team brought in a standard Tourna-Crane, reduced the boom height, and jockeyed the heavy, bulky equipment into place . . . like slipping an extra layer into the Sunday cake!

McGraw men, machines, methods and materials have established an outstanding record of meeting and conquering tough problems of industrial construction and mechanical erection for the major firms in American industry. A McGraw engineer would be happy to discuss your construction or installation problems with you – no obligation, of course.

F. H. McGRAW & COMPANY

ENGINEERS AND CONSTRUCTORS TO AMERICAN INDUSTRY

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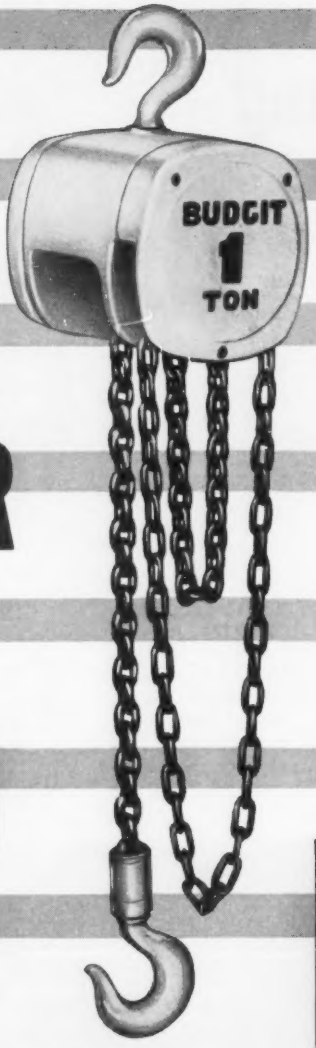
SHOW ME YOUR TOUGH LIFTING JOBS!



Here's the hoist to handle them in a hurry. It's the 'Budgit Aluminum Chain Block. Talk about easy pull; this hoist really has it. One man can lift a 500 lb. load with only 25 lbs. of muscle effort. The ½-ton size weighs only 29 lbs. Easy to carry anywhere a fast lift is needed.

The 'Budgit' Aluminum Chain Block takes hard knocks because super-strength is built into every part from top hook to load hook. Extra safety and efficiency is provided by the big "full jeweled" load brake. It's a fast-acting, automatic brake that makes lowering so smooth and easy loads can be "spotted" with hairline accuracy.

Put the money-saving advantages of the 'Budgit' Aluminum Chain Block to work for you. Spark-resistant models are available for use where such a safeguard is essential. Capacities: ¼ to 10 tons. *Call your nearby "Shaw-Box" Distributor for details or write us for Bulletins 405 and 415.*

I-Beam Trolleys, equipped with ball bearing wheels are available in standard and spark-resistant designs. Plain and hand geared types. Capacities to 20 tons.

Safety Hooks are available to "lock in" slings and other attachments used to support loads. All capacities.

Carrying Case. Heavy canvas riveted to sturdy base plate. Has zipper and leather handle. For 'Budgit' Aluminum Chain Blocks up to 1 ton.

57C-4

'Budgit'® CHAIN BLOCKS

MANNING, MAXWELL & MOORE, INC.
SHAW-BOX CRANE & HOIST DIVISION
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Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves. 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

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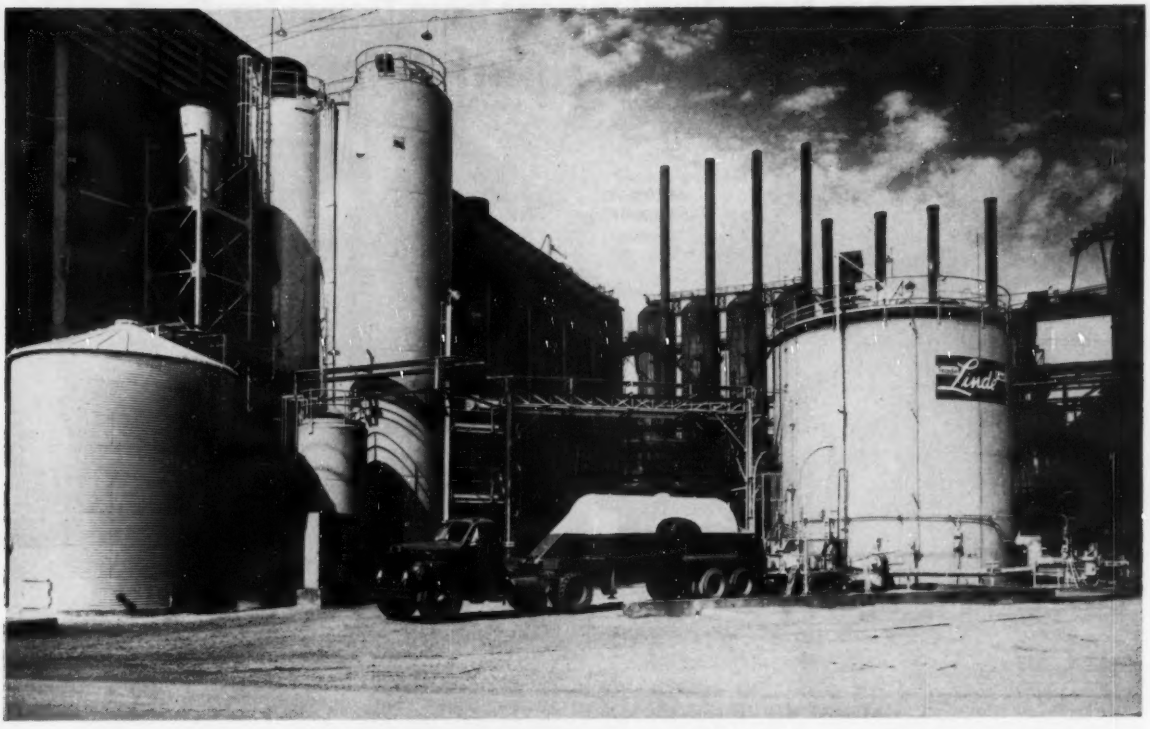


Liquid storage tank and interchanger outside the compressor building of the Linde oxygen plant at Duquesne Works, U.S. Steel

Oxygen Boosts Ferromanganese Production

By adding 6 per cent more oxygen to the blast air for its furnaces, Duquesne Works of U.S. Steel is getting 25 per cent greater ferromanganese production

TWO blast furnaces are turning out 850 tons of ferromanganese a day at the Duquesne (Pa.) Works of U.S. Steel. Two months ago they were producing only 650 tons. Oxygen makes the difference.

U.S. Steel says they're the biggest furnaces on ferromanganese (on pig iron they'd have a combined production of about 2000 tons a day). It takes a 500 ton a day oxygen plant to enrich the blast by 6 per cent. Linde Co., a division of Union Carbide Corp., which built the plant, says it's the world's largest single oxygen unit for steel plant service.

Volume—By boosting its ferromanganese production at least 25 per cent by oxygen blast enrichment, the corporation is able to supply its entire needs for that ferroalloy when operating at 85 per cent of capacity. As it works out, the corporation will still buy some outside and will continue to sell some, especially to Pittsburgh area plants. Ferromanganese production at the Ensley (Ala.) Works will probably be tapered off.

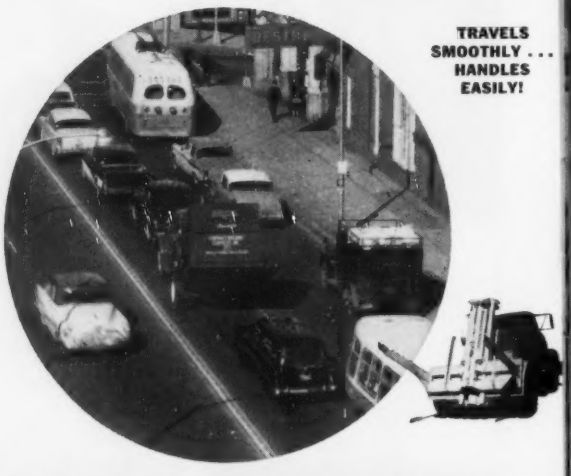
The furnaces get their manganese ore from India, South Africa, Ghana, Brazil, Mexico, Cuba, Australia and New Zealand—none from the U.S. Manganese, frequently in the form of ferromanganese, goes into virtually every kind of steel made. It helps to remove sulphur and increases hardenability and strength.

Plant—The $3-million oxygen plant at Duquesne is housed in a building that formerly contained steam blowing engines for the furnaces. Newer turboblowers made steam capacity available to power

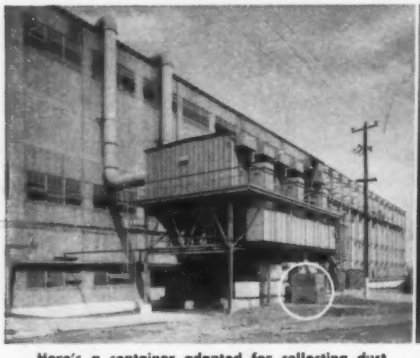
Here's Another New Development from Dempster Brothers to cut

Now Automatic Pick-Up of Dempster-Dumpster

AUTOMATIC PICK-UP!

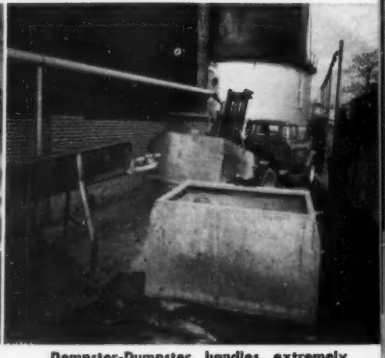


TRAVELS SMOOTHLY . . . HANDLES EASILY!



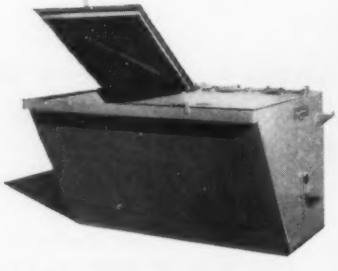
Here's a container adapted for collecting dust from two 75-ton furnaces.

Containers can be served inside buildings.



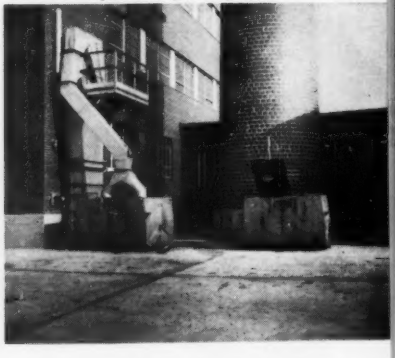
Dempster-Dumpster handles extremely heavy materials like this Fullers Earth.

Sump Bottom Containers are available. This leak-proof feature is desirable wherever moist, liquid and wet refuse is a problem.



Tilt Type Containers for handling liquid and solid materials are available.

Adaptation like this one for handling cinders from furnaces illustrate another flexibility advantage of the Dempster-Dumpster system.



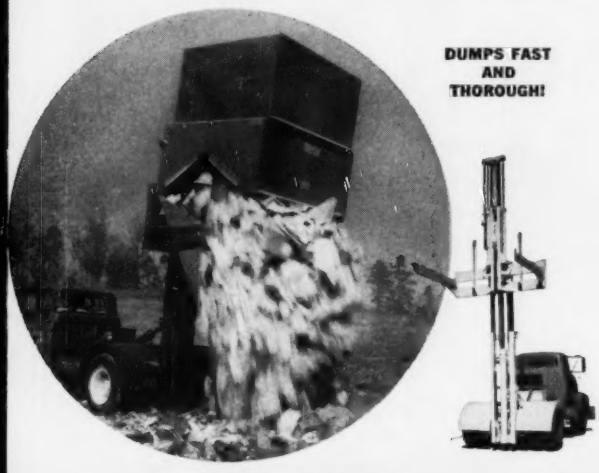
THE DEMPSTER DUMPSTER® SYSTEM

DEMPSTER BROTHERS

667 Dempster Building, Knoxville 17, Tennessee

Materials Handling Cost in Manufacturing Plants - - -

Containers— Driver Never Leaves the Cab!



DUMPS FAST AND THOROUGH!

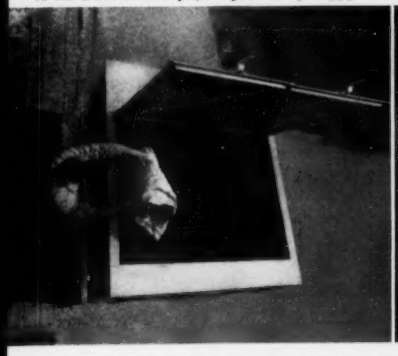
Here is an achievement that leaves little, if anything, to be desired in the handling of bulk loads with big steel Dempster-Dumpster Detachable Containers . . . another flexibility advantage available only in the Dempster-Dumpster System! The GRD 304-F-2 is a truck-mounted Dempster-Dumpster with fork-like arms. It enables containers to be picked-up, hauled, dumped and returned to location without driver ever leaving cab. All this, plus shorter turning and maneuvering area requirements, and plus high dumping — a versatile range of dumping heights up to approximately 11'. This new Dempster-Dumpster offers many advantages for speeding-up handling of bulk material loads in big Dempster-Dumpster Detachable Containers that are worth consideration in your plant now! Write us today for complete literature on this new Dempster-Dumpster. Or, if your operation would require greater payload handling capacities, ask us about our Dempster-Dumpsters built to handle payloads up to and over 36,000 pounds, plus detachable containers up to 21 cubic yards in size. Manufactured by Dempster Brothers, Inc.

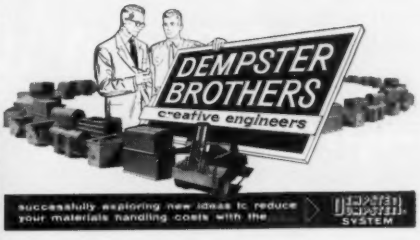
And services Skip Type Containers having required bale.

Acid materials like these stripped battery cases are just a sample of the type of wastes handled.

Many Standard and Special Tank Type Containers for handling liquids, chemicals, oils, etc., are available.

Big 15-yard Universal Containers are available. Note the area of the top opening. Standing in the container you would see the view as camera pictures it at right below. "Like trying to fill a bottomless pit," report many happy users.




DEMPSTER BROTHERS
creative engineers
successfully exploring new ideas to reduce your materials handling costs with the
DEMPSTER DUMPSTER SYSTEM

Clip and mail this coupon for **FREE LITERATURE!**

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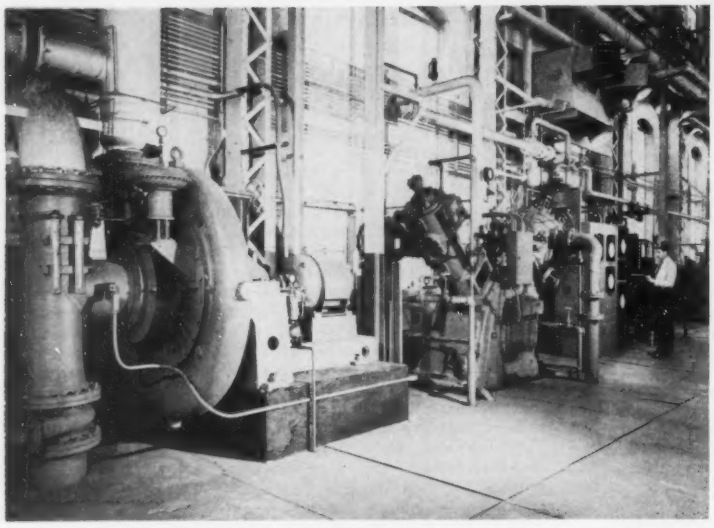
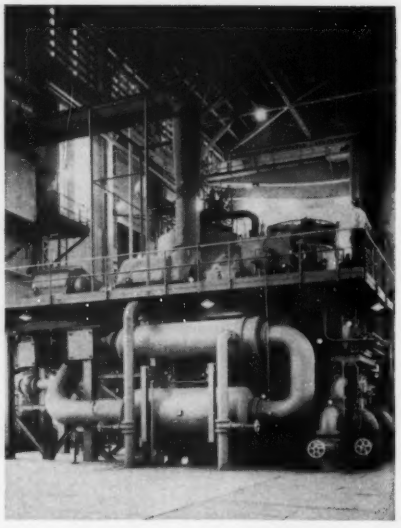
Please send me folder on the new Dempster-Dumpster GRD 304-F-2 and the Dempster-Dumpster System.



Pipeline centrifugal compressor for low purity oxygen (left) and baseload compressor for high purity oxygen (right) in the Duquesne plant



First compression stage, a 42,000 cfm centrifugal compressor with its steam turbine

the 42,000 cfm centrifugal air compressor in the oxygen plant.

Linde retains title to the plant. U.S. Steel owns the site and building and furnishes operating personnel (their wages are billed to Linde). Linde in turn sells oxygen to the corporation and maintains the plant.

The unit is capable of delivering: 1. Low purity (95 per cent) oxygen by pipeline directly to the ferromanganese furnaces at a rate of 430,000 cu ft per hour. 2. High purity (99.5 per cent) oxygen to pipelines servicing electric furnaces, scarfing machines and other operations at an initial rate of 42,000 cu ft per hour. 3. Liquid oxygen to storage.

Stand-By—To carry over shutdown periods necessary for maintenance, a 15 hour reserve supply of low purity liquid oxygen (Drioox) is stored in a 10 million cu ft tank. Extra or emergency oxygen is quickly available by tank car and truck from other Linde plants.

The ability of tank cars to handle emergency conditions was demonstrated in the winter of 1954-55. The Duquesne Works conducted a three month, full scale test of oxygen enriched blast on a ferromanganese furnace that called for up to 300,000 cu ft per hour above normal mill requirements. Demand was easily satisfied by tank cars of liquid oxygen which emptied their loads directly into pipelines. The oxygen passed through converters and then to the blast furnace.

Benefits—One of the big dividends in using oxygen enriched blast in the blast furnace is the reduction in coke rate it makes possible. Since ferromanganese furnaces consume about 2.5 times as much coke per ton of metal as pig iron furnaces, it is a big item. The oxygen also affects blast temperature, which in turn has a decided effect on the silicon content of the metal.

Oxygen enrichment has had little effect on furnace dust—160 tons a day are collected and stockpiled. U.S. Steel is trying to find an economical method to use the dust, which runs 18 per cent manganese. It can't be charged as ore; it's too low grade.

Growth—In the last ten years, the steel industry has almost doubled its use of oxygen. It is now close to 200 cu ft per ton of ingots produced. About a tenth is used for welding, cutting and scrap preparation; a half goes for scarfing; two-fifths are used metallurgically.

Some big potential uses, such as the oxygen converter and blast furnace blast enrichment, are just getting started. Other uses, such as lance injection in the electric furnace, are preferred practice or the only practical production method. In the open hearth, it's widely used for fuel enrichment, but practice with the lance varies. Lance injection in the open hearth is rarely used at Duquesne Works.

Breakup — The company found some real savings in another direction. Ferromanganese is traditionally cast in shallow pans (at Duquesne the pans are brick-lined railroad cars resembling gondolas, but with lower sides). After the metal solidified, a crew used to attack it with sledge hammers. The method was expensive, inefficient and rough on the pan lining.

Now the pan-cars are taken out in a yard. One man with a sledge opens up one corner of each pan; than a Gradall takes over. The scooping action of the Gradall does a better job of breaking up the fragile metal than the sledges did, and it's much easier on the refractories.

Because every open hearth superintendent seems to want his ferromanganese a different size and in a different package, lumps are sent through a crusher and sized on screens.

They are packaged to customer specifications.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

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MACHINING PERFECTION always starts with the right steel

Higher speeds and greater accuracies are the aims of gaging machine manufacturers. Future systems will use the basic theoretical concepts of machine control

1—This machine can make up to ten simultaneous measurements on odd-shaped parts. Other Sigmatic units can handle as many as 36 dimensions

A Look Ahead at Gaging

MATHEMATIC and automatic control theories are at least five years ahead of their application in the machine tool field, says Arthur H. Wolfson, manager of gage research and development, Pratt & Whitney Co. Inc., West Hartford, Conn.

Gaging machine manufacturers are working in the future, getting ready for the automatic machine line. Tomorrow's gaging will be based on the electromagnetic spectrum (including the ultrahigh frequencies), longitudinal vibrations (such as sound) and particles (such as electrons and beta rays).

Progress—Mr. Wolfson divides gaging machines into three general categories:

1. Equipment which can be further developed and improved without major scientific advances. 2. Equipment to which advanced engineering, automatic control theory and mathematics will be applied to a greater extent. 3. Equipment which cannot be realized until major advances are made.

First Group—The Sigmatic gage (photo 1) is typical of the first group, explained Mr. Wolfson, speaking before the 21st Annual Machine Tool Electrification Forum sponsored by Westinghouse Electric Corp., in Buffalo.

This machine gages several dimensions. High and low limits are indicated by lights. Gage solenoids sort parts as high, low and acceptable. This type gaging is carried one step further by adding an automatic feed hopper.

Second Group—When the gaging system includes postprocess automatic control of four machines, it falls into the second category. Statistical concepts become important in determining when to correct the machine and by how much.

Probably, gages of this type will handle many more dimensions and operate at higher speeds. The gage in photo 2 is designed to operate at 3400 parts an hour.

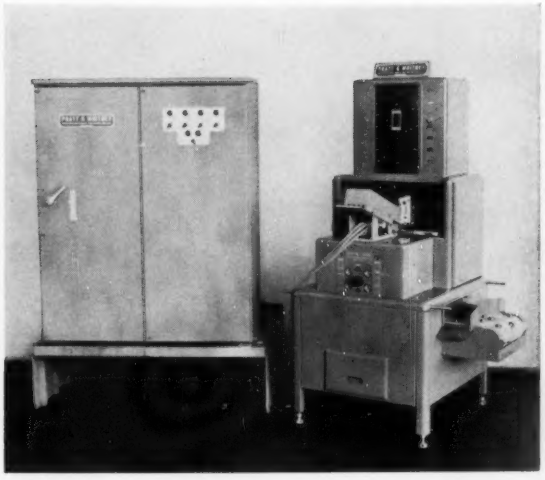
Bearing Gage—Also within the second category is a gage that measures the diameter and taper of rollers for bearings and sorts them automatically (photo 3).

There are two main sections of this unit—the gage with its material handling equipment and the electronic control cabinet. The tapered rollers are hopper fed through a tube to the gage transporting mechanism.

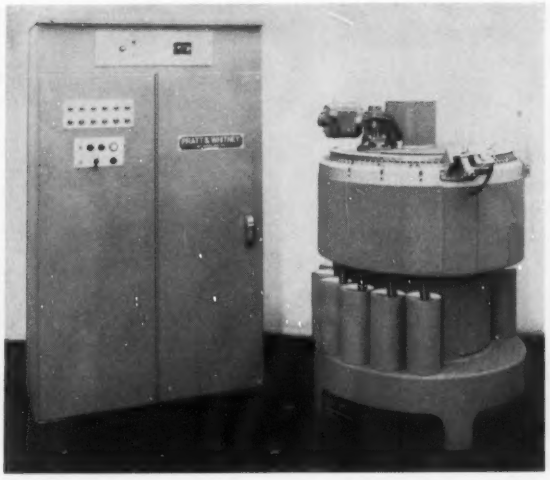
The gage head transmits information to the control cabinet, and sizes 1 through 10 are indicated by flashing lights. Parts also are rejected for high or low taper. A service light goes on if the control circuit should malfunction.

Memory — After the part has been gaged, and indication of its size is sent to the control cabinet, "memory" is provided, so when a part passes near the proper bucket, it will be ejected.

These sections make it possible to gage to tenths of thousands automatically (each part differs in



2—Ball bearing races are fed to the gage from four screw machines. The gage feeds back to the machines in sequence and will call for a manual correction when statistical trend indicates need



3—Automatic gage classifies tapered rollers into ten diameter categories (one ten-thousandth of an inch apart) as well as into high and low taper categories. Speed is 300 parts a minute

diameter from the next by 100 millionths of an inch) at 300 parts a minute.

Bearing Races—Another gage illustrates an advance in development of Cypak magnetic control. It measures and sorts ball bearing races into good, high and low categories.

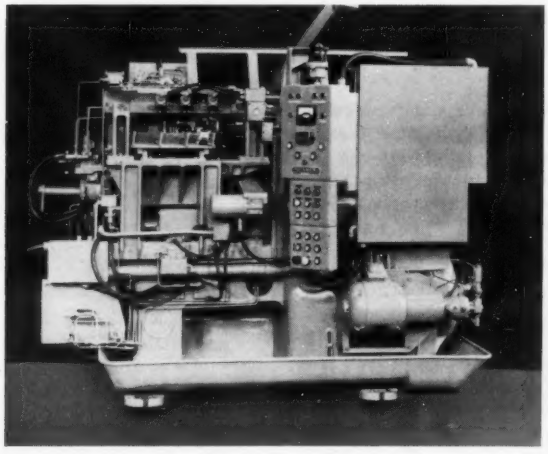
After parts roll down the chute, they are pushed into gaging position by an air motor. They are gaged for outside diameter in two places while being rotated. At the end of the gaging cycle, the air motor moves back to allow a new piece to drop into waiting position. This actuates a timer which controls the gaging time for the piece preceding it.

In Process—Another example is the in-process control of a lathe that is turning laminations of die-cast rotors for fractional horsepower induction motors (photo 4). In this system, the gage measures the size of each part and automatically resets the turning tool on the rear slide of the lathe to compensate for tool wear.

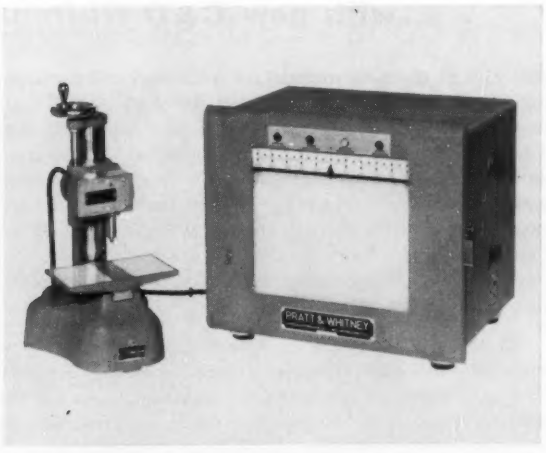
The control also indexes the circular turning tool to a fresh surface when allowable wear is reached. Parts are sorted into on-size, oversize and undersize chutes. If an out-of-tolerance part is made, the machine is automatically shut down. Its control is to tenths; controlling to hundredths lies ahead, says Mr. Wolfson.

Third Group—The comparator in photo 5, which gages accurately to one-millionth of an inch, offers a glimpse at the future. The next step is gaging to fractions of one-millionth of an inch. Pratt & Whitney is working with the National Bureau of Standards on a project which has one ten-millionth of an inch as its goal.

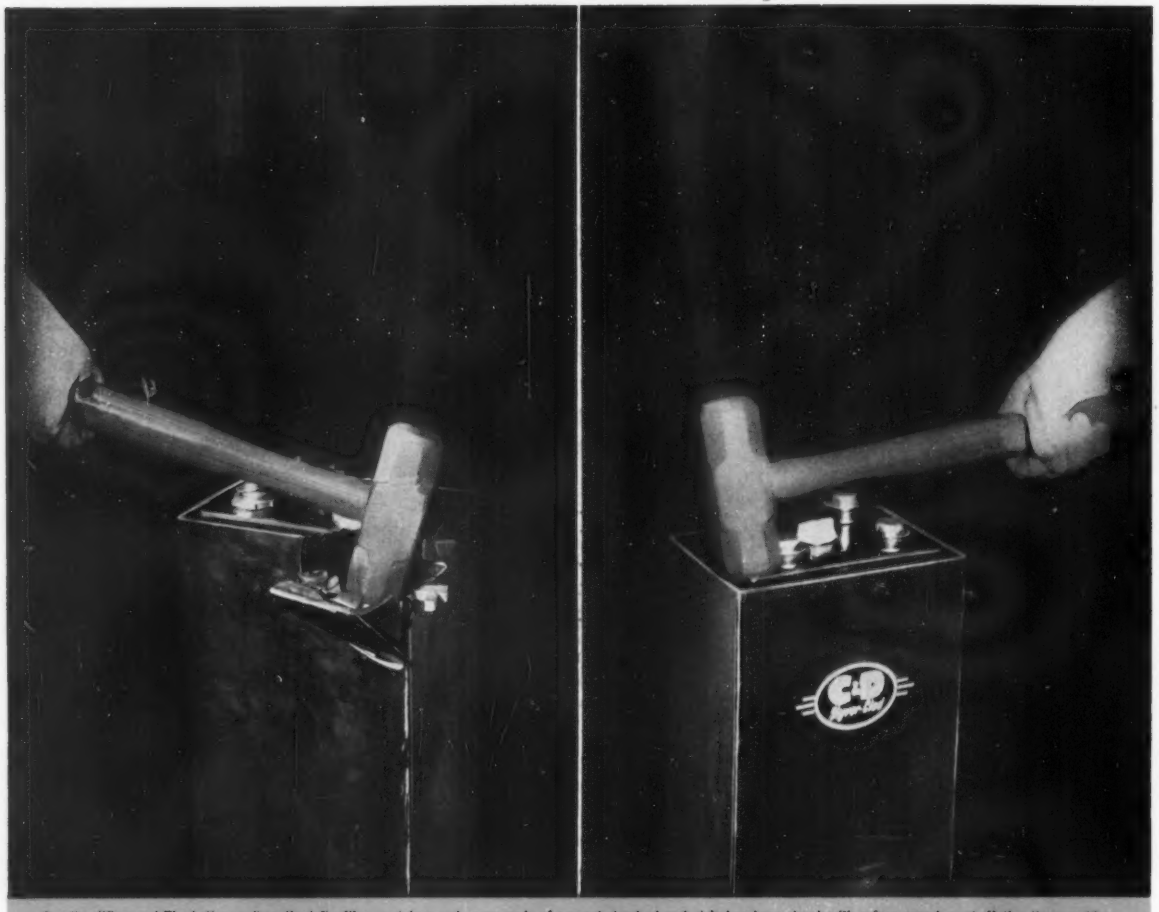
Problems include wringing error, penetration of light, temperature control and the metallurgical stabilization of gage material.



4—In-process control of a lathe. Turning tool is automatically indexed for wear



5—This comparator will indicate one-millionth of an inch per division on a strip chart recorder



See the difference! The battery cell on the left with a container and cover made of present standard materials has been struck with a four-pound maul. Notice the smashing and cracking. C & D's Slyver-Clad cell, with the container and cover made of new, exclusive C & D *Hi-Impac* compound was struck the same way—without a sign of breakage! Imagine the damage to truck batteries prevented, and the resulting time and money saved on repairs with batteries made of C & D's new *Hi-Impac* material.

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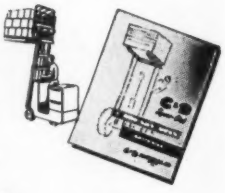
For details and specifications on C & D *Slyver-Clad* batteries with *Hi-Impac* cell covers and containers for electric industrial trucks and motorized lift trucks, write for Bulletins IT-524/56 and IT-525/56.



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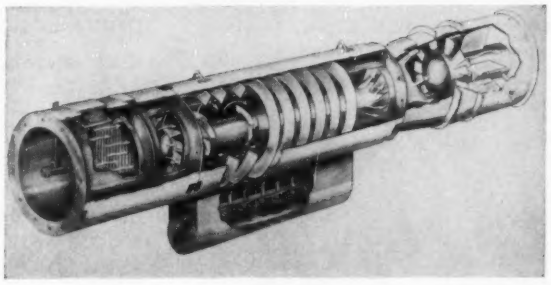
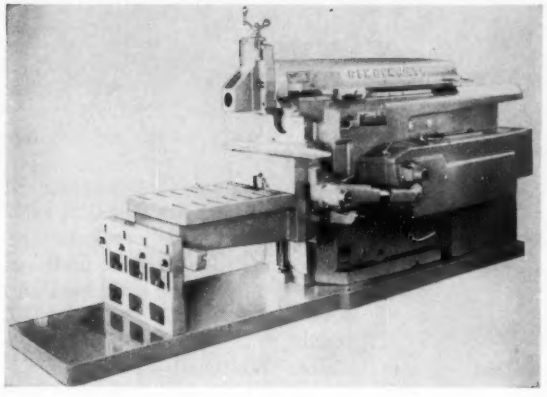
Dust Collector Is Small, Mounts in Existing Ducts

The Microdyne is a wet type unit that can collect over 99 per cent of dust particles 5 microns and larger. Capacities are from 2500 to 64,000 cfm.

Air enters the collector through a mixing section which causes air to impinge against a film of water. This traps the dust which is separated from the air in the eliminator section. Vanes impart a helix motion. Resulting centrifugal force throws the dust laden air into blind louvers in the periphery of the eliminator section. The louvers are connected to a disposal pump. *Write*: Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa. *Phone*: Grant 1-2140



Heavy Duty Shaper Has Automatic Lubrication System



This 36-in. heavy duty shaper is equipped for machining internal gate valve guides.

The special ram head has an automatic power downfeed. Large castings are accommodated by a special clearance table.

The slot-free ram and extended-ram bearing construction of the unit provide maximum rigidity.

A pressured oil film is maintained at all important moving connections by a 50 psi lubrication system.

Operation is simplified and worker fatigue is reduced by the brushless electromagnetic clutch and brake with fingertip control. *Write*: Cincinnati Shaper Co., Hopple, Garrard and Elam streets, Cincinnati 25, O. *Phone*: Kirby 1-5010

Gun Drilling Machines Have Spindle Speeds Up to 8000 Rpm

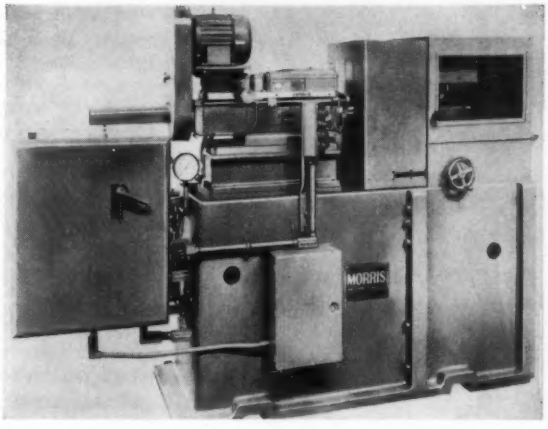
Feeds up to 40 ipm are possible with one and two way models of these automatic machines.

Feeds strokes (6 and 9 in. models) are infinitely adjustable. Speeds and feeds are independent.

The machines can be used for drilling deep holes (⅛-in. diameter and larger), shallow holes where straightness, size and finish are crucial and for jobs demanding a high rate of metal removal.

An adjustable load control senses conditions that might cause trouble. It protects the machine against breakage of gun drills or workpieces.

The control automatically detects dull or chipped drills, hard spots in the material or insufficient coolant, and the quill is reversed automatically. *Write*: Morris Machine Tool Co., 933-36 Harriet St., Cincinnati 3, O. *Phone*: Parkway 1-5616



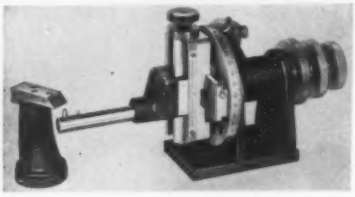
NEW PRODUCTS and equipment

Wheel Dresser

The Tangi-Matic dresses grinding wheels with clockwise or counter-clockwise rotation.

Grit particles dressed from the wheel are thrown away from the dresser. The operation is clean because the wheel guard is not removed during the dressing.

Direct reading scales make possible quick, accurate setups.



Once the diamond is zeroed to the master setting block, all radius settings are made by a micrometer adjustment. A dial and vernier set the desired angle. Tangent settings are milled in degrees and minutes. *Write*: Threadwell Tap & Die Co., Greenfield, Mass. *Phone*: Prescott 4-4338

Trimming Presses

Flash on diecastings is removed by this line of wide bed machines. Hydraulic or mechanical models are available in 25 to 60-ton capacities.

Bed sizes are from 18 x 32 in. to 24 x 36 in. There are openings in the bed for scrap disposal.

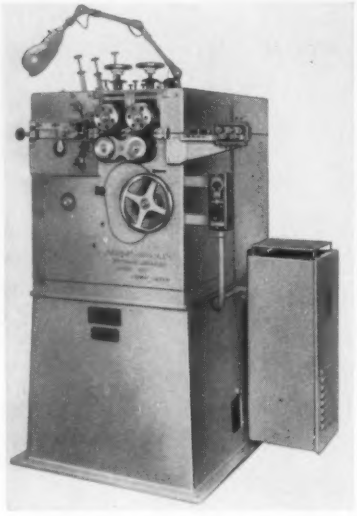
The slide area ranges from 12 x 18 in. to 20 x 34 in.

Stroke lengths are from 3 to 12 in. Stroke frequencies range from 30 to 120 a minute. *Write*: Clearing Machine Corp., division of U.S. Industries Inc., 6499 W. 65th St., Chicago 38, Ill. *Phone*: Portsmouth 7-8700

Spring Coiler

This universal machine uses cams to raise and lower the feed rolls for accuracy of measurement. The holding action allows more than one revolution of the feed roll per spring.

A feed cycling arrangement is combined with continuous coiling and manual cutter control to give feed ranges beyond the standard limitations.



The wire feed does not vary with an increase in speed.

There are no stopping, starting or reciprocating motions in the feed mechanism. Only the wire moves. *Write*: Sleeper & Hartley Inc., Worcester, Mass. *Phone*: Pleasant 4-3249

Controlled Atmospheres

Generators for controlled atmospheres of about 40 per cent hydrogen, 40 per cent nitrogen and 20 per cent carbon monoxide have standard capacities of 750, 1000 and 1250 cu ft an hour.

These completely packaged units produce an endothermic atmosphere with a low dew point. The gas and air are measured by separate flowscopes. The air-gas mixer is equipped with a manual ratio adjustment.

All components are piped and wired. *Write*: Eclipse Fuel Engineering Co., Rockford, Ill. *Phone*: 8-3751

Detergent

Oakite LSD is a liquid detergent for use in steam cleaning equipment. It is for light to medium-heavy duty cleaning.

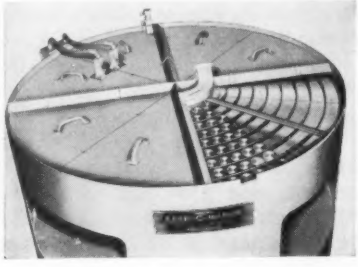
Concentrations of 1 or 2 ounces of the detergent are added to each gallon of water delivered by the steam gun. It may be used on steel, brass and magnesium. *Write*: Oakite Products Inc., 134E Rector St., New York 6, N. Y. *Phone*: Whitehall 3-0940

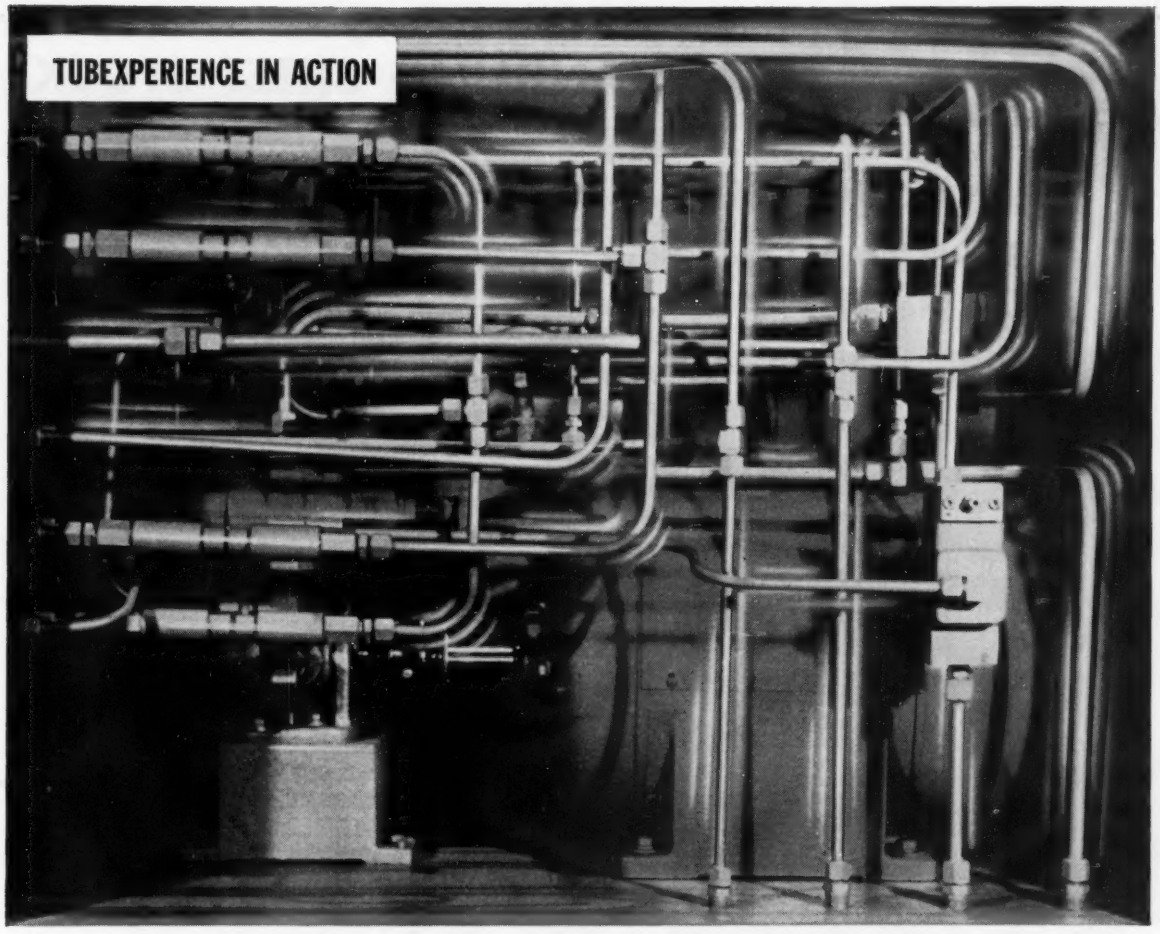
Storage Unit

Spur gears and irregularly shaped and interlocking parts that normally do not roll are stored by this circular unit.

There is no dead storage. Parts are handled on a first in, first out basis.

They enter the unit at the center of the top, are chuted to the center





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Fully tested! *And not mere random sample testing! Every length of Superior (SAE) hydraulic tubing is 100% hydrostatically tested at maximum working pressure—giving you realistic performance insurance.*

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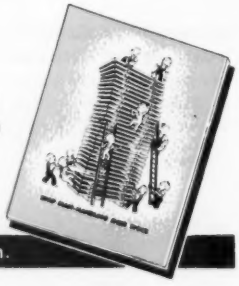

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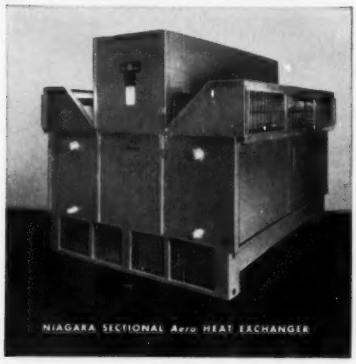

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NEW PRODUCTS and equipment

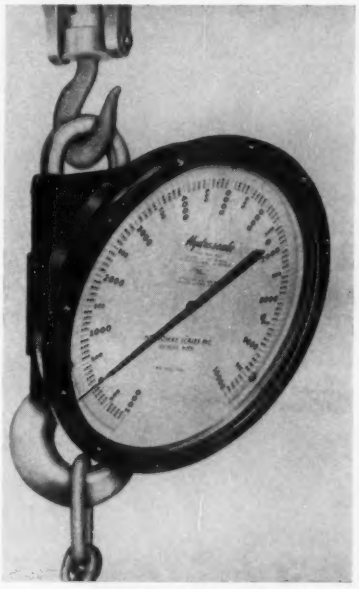
of the upper tier where they slide onto the inner tracks. The tracks run spirally to the outer edge of the tier.

The tier base rotates and imparts the motion to the parts. Each tier handles about 300 parts. As many tiers as needed can be used. *Write*: Gear-O-Mation Division, Michigan Tool Co., 17140 W. Ten Mile Rd., East Detroit, Mich. *Phone*: Prescott 9-0100

Crane Scales

Head room of only 14½-in. is needed by these crane scales in 6000 and 10,000-lb capacities.

Both models have 12-in. diameter dials, set at a 20-degree angle for easy reading.



The scales have tare adjustment knobs and locks so that the net load can be read. Maximum tare adjustment is 20 per cent of the dial capacity. *Write*: Hydroway Scales Inc., 31302 Stephenson Highway, P.O. Box 531, Oakridge Station, Royal Oak, Mich. *Phone*: Jordan 6-3965

Centering Reels

Coils up to 15 tons, 60 in. widths and 72 in. diameters can be handled on this single spindle centering reel.

A contoured, four jaw expanding

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ALL-BASIC OPEN HEARTH FURNACE

Provides greater refractoriness for increased production at low cost.

This development in open hearth furnaces, which has scored impressive results both in Europe and America, marks an important step forward in the history of steelmaking. In the All-Basic Open Hearth Furnace, the roof, front and back walls, port ends, downstakes, and at least part of the checker system are all constructed of basic brick.

Properly handled, the All-Basic Furnace operates more economically than those made of silica, with equal or lower fuel costs, and with decreased overhead charges, resulting in a decrease in cost of ton per ingot.

For complete information on this important new development, write for free technical report: "The All-Basic Open Hearth Furnace."

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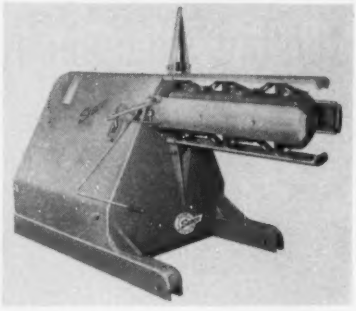
KIRK & BLUM DOWN DRAFT DUST CONTROL

NEW PRODUCTS and equipment

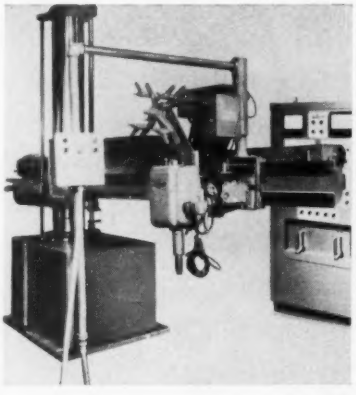


arbor permits variations of the inside coil diameters up to 6 in. The coil is always locked in position.

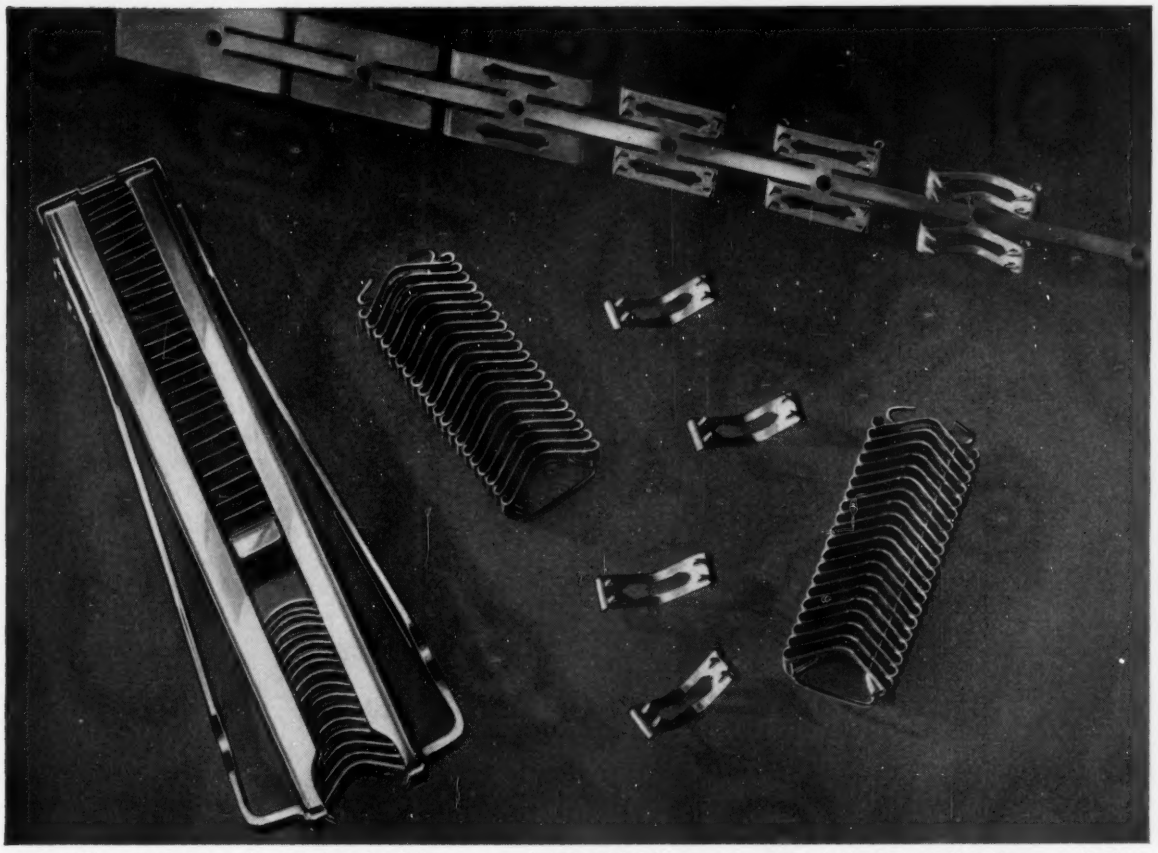
A variable speed drive rotates the spindle. One man operates the controls. They include push-button start, emergency stop, inch forward, inch reverse, expansion and retraction. *Write*: Sesco Inc., 8881 Central Ave., Detroit 4, Mich. *Phone*: Texas 4-1701

Welder Is Versatile

This radial fusion welder does both circumferential and longitudinal welding. Quick-change welding heads enable use of the unit for metallic inert gas, tungsten inert gas and submerged arc processes.



The machine's radial arm has multiple station positioners. One man operates the welder while the other loads and unloads parts at the positioners. *Write*: Welduction Corp., 10230 Capital Ave., Detroit 37, Mich. *Phone*: Jordan 4-6768



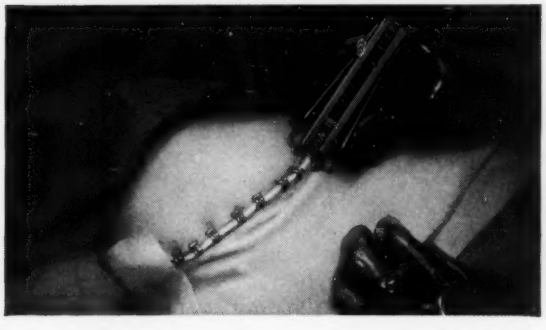
Above: The various steps in forming Autoclips® from Anaconda 18% Nickel Silver strip, .637" wide by .013" thick. Below are individual Autoclips and those mounted in wire holders ready for insertion in Autoclip Applier, at left. Exclusive wholesale distributor for Autoclip is Clay-Adams, Inc., New York City. ***Below, left:*** Autoclips being used to attach skin towel to edges of incision.

Anaconda Technical Service helped in

Selecting the exact Nickel Silver strip for this surgical clip

THE PROBLEM: The Technical Oil Tool Corporation, Los Angeles, developed Autoclip, an automatic magazine-type clip and applier to close wounds or incisions faster and easier. Selecting the right metal for the clip was the problem. A certain amount of tension was required to hold the wound edges together during healing, with the least amount of damage to tissues. In addition, the clip had to open easily for painless removal. The metal should be easy to form, and retain sharp, die-cut edges.

THE SOLUTION: After several unsuccessful attempts with various metals, sample clips of the required gage were made of Nickel Silver. These silvery white copper-alloys have excellent resistance to corrosion in service or in storage and have been time-tested for surgical instruments and equipment. Technical specialists of The American Brass Company suggested Nickel Silver, 18%-719—one of four standard Anaconda Nickel Silver Alloys—as the one best suited to meet all the requirements including tension, formability, clean edges and sharp points.



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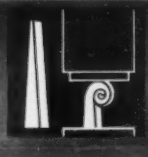


1800 Union Commerce Building Cleveland 14, Ohio

NEW literature

Write directly to the company for a copy

Tubing Strength

Bulletin ASL 288, 5 pages, discusses results of a long term test of corrosion and high temperature problems in tubing. Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa.

Tube Fitting Wall Chart

This chart, No. 4300C3, shows steel fittings for connecting steel tubing lines. A size table is included. Tube & Hose Fittings Division, Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, O.

Bar Machines

Automatic shaft machines for 1⅝ and 2½-in. stock are described in a 4-page bulletin. Cleveland Automatic Machine Co., 4932 Beech St., Cincinnati 12, O.

Router Bits

Specifications for straight fluted and spiral fluted bits are given in a 4-page bulletin, RB-56. Detroit Tap & Tool Co. 8615 E. Eight Mile Rd., Baseline, Mich.

Automated Production Methods

A description of engineered and automated material handling systems is included in this bulletin—16 pages. Planet Corp., 1800 Sunset Ave., Lansing, Mich.

Carbide Tools and Dies

Properties of carbides as used in dies are discussed in this 8-page bulletin. Jaquith Carbide Division, Pratt & Whitney Co. Inc., 19 Stewart St., Lynn, Mass.

Welded Fasteners

Nuts applied by resistance welding are described in catalog No. 58, 40 pages. Ohio Nut & Bolt Co., 33 First Ave., Berea, O.

Motor Rewinding

Applications of silicone insulation in rewinding motors are discussed in this 6-page bulletin, No. 10-104. It includes a description of silicone insulation, its history and importance. Dow Corning Corp., Midland, Mich.

Conversion Chart

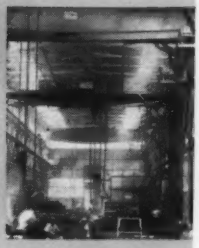
Conversion data for Rockwell tests and other hardness scales are shown. Tables for cylindrical corrections are included. Torsion Balance Co., Clifton, N.J.

Pulling pattern from mold for 12-ton casting

EASY UP does it!

Handling sandslinger sand bucket

Spotting 15-ton casting on flat-car for inter-plant transportation



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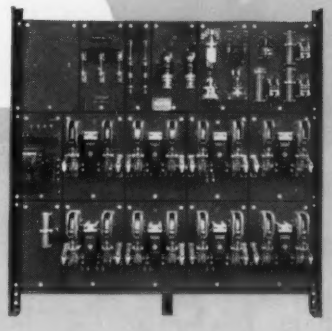

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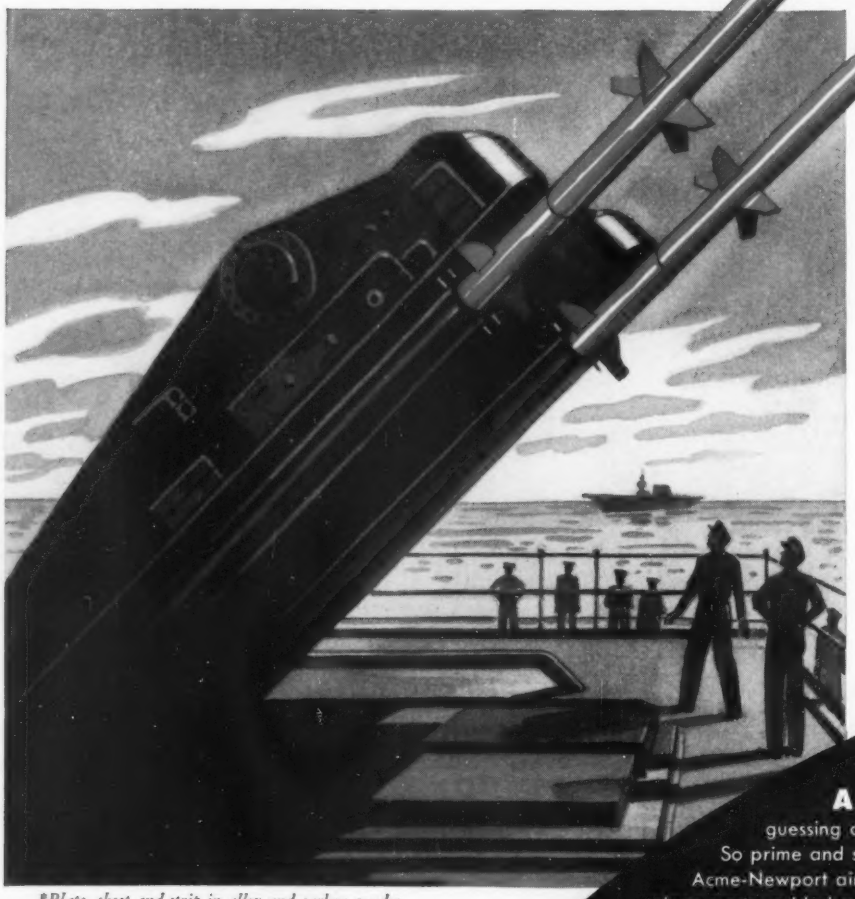

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Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

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STEEL

June 24, 1957

Market Outlook

WHEN the first half of this year ends next Sunday, the nation's steel mills will have produced 60,785,000 net tons of steel for ingots and castings. This is at an annual rate of 121.5 million tons.

Never have we turned out this much in a year. The record is 117,036,085 tons (1955). Hardly anyone expects 1957 to touch 121.5 million, but we could come close to it with only a moderate pace in the last half.

ANALYSIS—Production in the first half averaged 91 per cent of capacity. If the average for the last half were only 89 per cent, the year's outturn would be 120 million tons of ingots. To equal the record of 117 million, the last half could coast along at an average of 84 per cent. We could equal the 1956 total of 115.2 million tons by producing at only 82 per cent of capacity in the last half.

Duplication of the first half's pace in the second half would yield a yearly record. But production in the first half did not set a record. It belongs to 1956 (62,607,172 tons).

TIME FOR SLOWDOWN—The second half of a year usually brings some slowing effects on steel production. In some years, it comes in the form of a general strike of steelworkers. We won't have that this year, but we'll have summer vacations. Some mills are closing down for mass vacations as are most plants of steel consumers.

LOCKED DOORS—Some users of steel will soon be restricting or halting steel intake because of vacation shutdowns. Usually, arrangements are made for taking in steel during such closings, but this year there are reports of plants preparing to close up shop completely, even to dispensing with the usual maintenance.

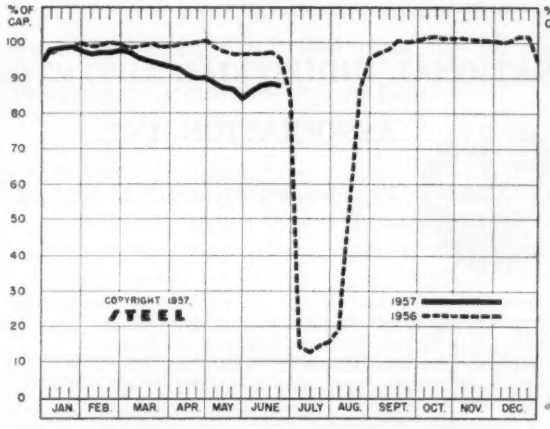
If any of this year is to be dull, it should be July and August. But they won't be washouts because steel consumption remains high. Too, there are signs of a pickup in some industries. Maytag Co., Newton, Iowa, maker of major appliances, is calling back some of its furloughed employees. The automobile industry is getting ready for its 1958 models. Some buying of steel for them is expected as early as July.

GOOD GOING—Even though demand has slackened since the first of this year, it remains good enough to keep ingot production around 88 per cent of capacity. That was the rate in the week ended June 23. In the preceding week, it was 88.5 per cent.

PRICE RISE NEAR—In another week, steel likely will cost more than it does now. An automatic wage increase due the steelworkers under the three-year labor contract becomes effective next Monday. A steel price increase is expected to accompany the wage boost. While there are many estimates of the price increase, most are in the $5 to $6 a ton range.

SCRAP LEVELS OUT—After seven consecutive weeks of rise, the scrap market leveled out in the week ended June 19 and held STEEL's scrap price composite at the preceding week's level of $55.67 a gross ton. In the seven weeks, the composite rose $13.17. A year ago, the composite was only $46.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended June 23	Change	Same 1956	Week 1955
Pittsburgh	88	0*	95	98
Chicago	86.5	— 1*	98	97.5
Mid-Atlantic	94.5	0	97	96.5
Youngstown	80	+ 3.5	101	98
Wheeling	83.5	0	99.5	96
Cleveland	90	+ 1*	95	101.5
Buffalo	102.5	0	105	104.5
Birmingham	92.5	0	23.5	93.5
New England	56	— 1	85	92
Cincinnati	85	— 3*	88.5	87.5
St. Louis	56.5	—28	96.5	106
Detroit	100	+ 1	94.5	97.5
Western	101	+ 2	105	108
National Rate	88	— 0.5	95.5	97

INGOT PRODUCTION‡

	Week Ended June 23	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	139.4†	137.8	137.7	142.6
NET TONS (In thousands)	2,240†	2,214	2,212	2,290

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 67 Technical Outlook—115

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New Seamless Tube Mill: In Top Ten in North America

Annual capacity to produce seamless pipe and tubing	Net tons
National Tube Division, U.S. Steel Corp.	2,017,130
Jones & Laughlin Steel Corp.	480,000
Youngstown Sheet & Tube Co.	456,000
National Supply Co.	395,000
Babcock & Wilcox Co.	276,000
Republic Steel Corp.	276,000
Timken Roller Bearing Co.	257,000
Pittsburgh Steel Co.	250,000
Colorado Fuel & Iron Corp.	240,000
Mannesmann Tube Co. Ltd.	**225,000**
Phoenix Iron & Steel Co., Barium Steel Corp.	75,000
Page-Hersey Tubes Ltd.	50,000
Tube Reducing Corp.	50,000
Copperweld Steel Co.	43,000
Michigan Seamless Tube Co.	32,000
Pacific Tube Co.	15,000
Columbia Steel & Shafting Co.	7,500
Allegheny Ludlum Steel Corp.	2,400
Superior Tube Co.	2,200
Ivins Steel Tube Works Inc.	2,000
Service Steel Division, Van Pelt Corp.	1,500

Source: American Iron & Steel Institute.

Mannesmann Tube Opens

$20-million plant built in Canada by German firm will make seamless steel casing and line pipe for oil country use. It will compete principally with U.S. producers

A NEW supplier of seamless steel tubular goods for oil country use is in business: Mannesmann Tube Co. Ltd., Sault Ste. Marie, Ont., which officially opened its $20-million production plant June 15.

This gain for Canada will be a market loss for the U.S. Canada's rapidly growing oil and gas industry has been heavily dependent on the U.S. for oil country tubular goods. Canada's minister of trade and commerce, C. D. Howe, told STEEL that about three-fourths of the oil country tubular goods used by Canada has been coming from the U.S., the rest from England.

In Top Ten—The plant will have an annual capacity of 225,000 tons of seamless, making it the tenth largest producer of that product on the North American continent (see accompanying table). Only one other company—Page-Hersey Tubes Ltd.—has seamless producing capacity in Canada. Its plant (annual capacity, 50,000 tons) is at Welland, Ont.

Most of Mannesmann's production is expected to go into the Canadian market, but the company points out that it will be able to make water shipments (except in winter) to the Texas oil fields via Chicago and the Mississippi river. The company is looking also to the St. Lawrence Seaway as an outlet to other countries. The plant is only a few blocks from the St. Marys river and the Soo locks.

Ready Market—Representatives of several U.S. seamless producers said their companies' sales wouldn't be hurt by the new Mannesmann plant. They believe growing demand, particularly from the oil and gas, chemical and electric power industries, will absorb the additional output.

But U.S. producers may find it increasingly difficult to sell oil country tubular goods in Canada: 1. The Mannesmann plant has a shipping cost advantage by being nearer the Canadian oil and gas fields. 2. Canada is considering an increase in its tariff on certain steel products (including pipe and tubing).

Timing—Ironically, the proposed tariff increase came out the day before the Mannesmann plant was officially opened.

U.S. exports of oil country goods and line pipe are small, though, compared with domestic sales. Of the 5,936,286 net tons of oil country tubular goods and line pipe shipped by U.S. mills in 1956, only 486,177 tons (8 per cent) were exported, and Canada received only part of them.

Two Products—At the start, the Mannesmann plant is making two products: 1. Seamless casing for oil and gas wells. 2. Seamless line pipe. (Casing is a retainer for walls of oil and gas wells, and line pipe is for conveying liquids and gas from producer to user.)

The casing conforms to American Petroleum Institute standard 5A, grades H-40, J-55 and N-80, with long or short threads and couplings. The size range is 4.5 in. OD through 10.75 in. OD.

The line pipe meets API stand-

ard 5L, in grades A and B, and API standard 5LX, in grades X-42, X-46 and X-52, and is available with plain ends or with threads and couplings. The plain end pipe has a size range of 4.5 in. OD through 10.75 in. OD. Threaded line pipe has a size range of 4 in. OD through 10 in. OD.

Mannesmann is not making drill pipe, seamless tubing for oil wells or seamless mechanical tubing. (Drill pipe transmits power by rotary motion from ground level to a rotary drilling tool below the surface. Oil well tubing fits inside the casing of an oil well and carries oil to the surface.)

Under Study—Later, the plant will probably make seamless tubing for oil wells and seamless mechanical tubing. The company is making studies to determine what kind of equipment to install for seamless tubing production.

Oil well drillers commonly buy tubing at the same time (and from the same place) it gets its casing. Mannesmann will buy tubing from German and U.S. companies until it can start making it.

The firm says its prices will be in line with those of U.S. mills.

Big Family—The plant is one of 70 controlled by Mannesmann A.G., Dusseldorf, Germany. Its plants and offices are in Germany, Brazil, France, Turkey, West Indies, Luxembourg, South Africa, the U.S. and Canada. Now employing more than 75,000, the firm will increase that figure to 80,000 upon completion of present expansion. Last year, Mannesmann A.G. had sales of about $800 million.

Assured of Steel—The company recently purchased a 10 per cent interest in Algoma Steel Corp. Ltd. Only a fourth of a mile from the Mannesmann plant, Algoma will supply the steel—a fourth of its output of steel will go in the form of tube rounds.

The location is a "natural," according to Wilhelm Zangen, president, Mannesmann A.G., Dusseldorf, Germany, and Dr. Gerhard Wagner, president, Mannesmann Tube Co. Ltd., Sault Ste. Marie, Ont.

Attractions—"We selected Sault Ste. Marie," Dr. Wagner said, "for two reasons: 1. The geographical situation enables us to use land and waterways in all directions. 2. It was necessary to establish close co-operation with a steel mill which could supply our needs for tube rounds."

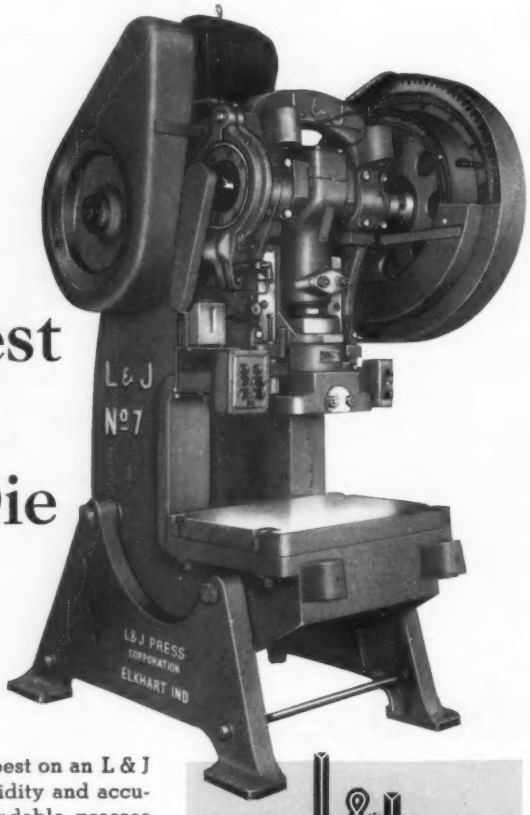
Mr. Zangen said that Mannesmann A.G., watching Canada's development since 1949, saw the need there for a seamless pipe and tubing mill. Also, "Algoma Steel was thinking about entering pipe production as an outlet for its steel," Mr. Zangen said. Algoma was looking for a market for steel. Mannesmann was looking for a source.

Tubular Goods . . .

Tubular Goods Prices, Page 172

Production of oil country goods will hold at capacity through the third quarter, report Pittsburgh area mills. In the final quarter, however, seasonal influences may cause slowing in requirements. Sales of pressure and mechanical tubing will decline next month, though demand currently is described as fairly strong. Auto

Gets the Best out of Any Die



Any die will do its best on an L & J No. 7 Press. The rigidity and accuracy of these dependable presses provide accurate die alignment that minimizes wear, and insures precision stampings. They also enable dies to produce maximum output for these presses are efficient, versatile and require but minimum maintenance. If productivity, tolerances and die life are important to you, then you'll be interested in the complete story of L & J No. 7 presses.

NO. 7 L&J PRESS

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Capacity—75 tons. **Stroke**—4", special max.—8". **Speed**—42 s.p.m. (85 s.p.m., non-geared). **Throat Depth**—13½". **Die Space**, standard—14", special max.—23". **Bolster Plate**—36" x 26" x 3". Also available in non-geared model. Air clutch optional at extra cost.

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L & J PRESS CORPORATION 1628 STERLING AVE. ELKHART, INDIANA

makers' demands for mechanical tubing will be limited until late summer.

New England distributors say pipe and tubing supply is in balance with demand. Only large seamless is short. Welded pipe is booked for delivery in one week.

Electricweld pipe is being used by more utilities in place of seamless.

Larger pipe supplies are made possible by improvement in availability of semifinished steel to the pipe mills.

The St. Louis area pipemaker reports shipments are still delayed, citing lack of order releases resulting from unfavorable building weather at some points.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 168

Substantial reinforcing steel tonnage is moving into construction of various classifications. But volume is not up to expectations for the season. In some sections, adverse weather conditions have delayed some programs, including highways.

The bar mills are turning out heavy tonnage, but output will decline over coming weeks as producers suspend for vacations. Reinforcing bar shipments in the first four months this year totaled 913,602 net tons, up substantially from the 801,843 tons shipped in the like period of 1956.

Bids are in to Washington state on the Narrows bridge which involves 1600 tons of reinforcing steel.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 169 & 170

From the mill point of view, sheet demand is little changed from that over recent weeks. It is too late for consumers to order tonnage as a hedge against higher prices next month. Deliveries can't be given in time. As a result, this class of business has about dried up. Even export demand is off.

June shipments will top the May total, but July specifications will be off because of vacation suspensions. Sellers, generally, don't look for any appreciable upturn in ordering until late August, by which time specifications should be coming through for the 1958 model cars.

Usually, arrangements are made by consumers to take in steel over the vacation period. This year, though, many plants will close down completely, delaying steel intake until just before they resume operations.

Price announcements at the end of this month are awaited with keen interest. Most market observers think an increase of $5 to $8 per ton will be effected.

Tin Plate . . .

Tin Plate Prices, Page 170

Metal can shipments in April totaled 506,329 tons, a sharp increase from the 323,791 tons moved in March, reports the U.S. Bureau of the Census. They also were up substantially from the 483,628 tons moved in April, 1956. The total for the first four months was 1,425,193 tons, compared with 1,417,666 in the like period last year.

April movements of fruit and

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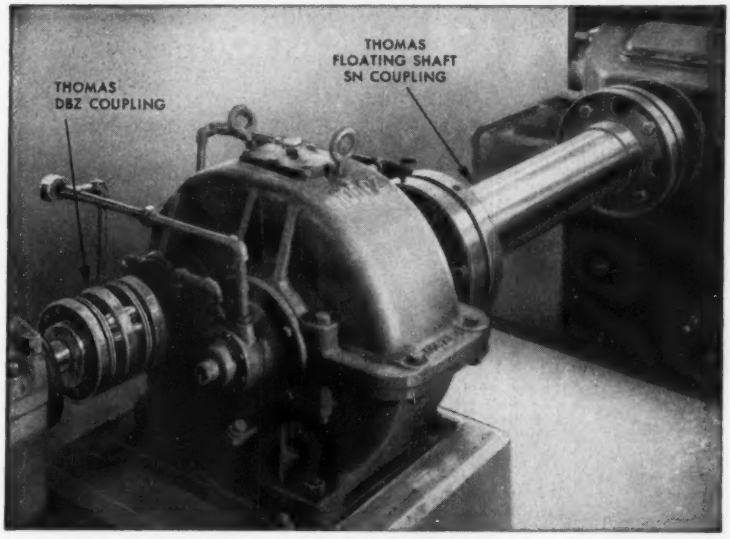

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8 No Maintenance

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THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

vegetable cans amounted to 184,738 tons, and compared with 68,407 in March, and 177,805 in April, 1956. Shipments in the first four months totaled 386,823 tons against 377,886 in the same 1956 period.

Beer can shipments were 77,482 tons in April, compared with 61,798 in March, and 68,883 in April a year ago. Beer cans shipped in the first four months totaled 231,634 tons against 216,651 in the corresponding period last year.

Wire . . .

Wire Prices, Pages 170 & 171

Price hedging against midyear increases and gaps in consumers' stocks are reflected in a slight lift in demand for wire products. The situation is spotty, both in merchant and manufacturers wire items. Sluggishness in housing starts is felt by the nailmakers.

Indications are there will not be much change in demand until late summer. Wire mill operations will dip sharply at the end of this month. The largest wiremaker, U.S. Steel Corp., suspends for vacations at some plants June 28. John A. Roebling's Sons goes down the first week of July. Other wire mills plan similar suspensions.

Webster & Webster Inc., East Hartford, Conn., is low bidder at $630,780 on another fence railing contract for the Connecticut turnpike.

Steel Bars . . .

Bar Prices, Page 168

Orders for bars have reached the low point for the year to date. Many consumers will shut down plants for vacations in July and requirements will be light. The vacation lag will continue through August.

Buyers stepped up June purchases slightly in an effort to beat the expected July price advance. This was done at the expense of future ordering and is restricting new orders. Right now there is a tendency for buyers to hold off on further orders pending settlement of the price situation.

The hot mills received few "rush" orders for delivery before the July price increase. But cold-drawn mills have been experiencing a last minute spurt. Further, consumers have been ordering a little more actively to fill inventory gaps. Business will slide again next month.

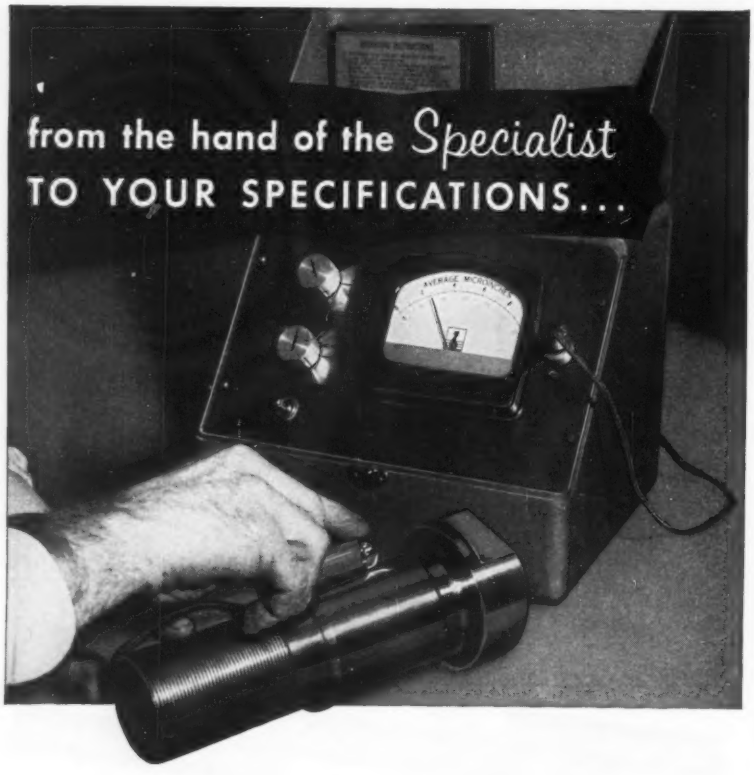
The Precision Drawn Steel Co., Camden, N. J., has installed a 150,000-pound draw bench. Designed by Aetna-Standard Engineering Co., Pittsburgh, it is capable of drawing up to a 5-in. mild steel round with a normal 1/16-in. draft. The company is building a 15,000-ft addition.

Warehouse . . .

Warehouse Prices, Page 173

Demand for warehouse steel is steady and about on a parity with that in May. Sales are off about 10 per cent dollarwise from a year ago. A dip in bookings is expected during the next two months. Distributors are encountering difficulty in keeping up with specifications only in heavy plates and structurals.

Warehouse operators in the Mid-



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west still await favorable weather to trigger a pickup in demand for construction items. Slack business in recent weeks has enabled them to round out their inventories.

Ferroalloys . . .

Ferroalloy Prices, Page 176

Prices on all grades of silicon metal were reduced 1.5 cents a pound, effective June 12, Electro Metallurgical Co., New York, announced. Reductions amount to about 7 per cent and apply across the board to all grades, sizes and quantities.

Several improved grades of silicon metal with reduced iron content were announced recently by the company. The table below lists the grades and the new lower base prices. Prices are per pound of silicon for car load lots of lump material in bulk, delivered by rail freight.

Max 0.50% iron	$0.2050 per lb
Max 0.75% iron	0.2000 per lb
Max 1.00% iron	0.1950 per lb
Max 1.25% iron	0.1925 per lb
Low-calcium (0.03% max Ca)	0.2050 per lb
Low-aluminum (0.10% max Al)	0.2150 per lb

Plates . . .

Plate Prices, Page 168

Sheared plate business, especially ½-in. and over, continues strong. Demand pressure isn't what it was some weeks ago. But makers are confident they will have no difficulty booking full for the third and fourth quarters. In general, demand for heavy sheared plates will take up output over the next month to six weeks.

Light plates are in adequate supply because of heavy tonnage coming from strip mills that ordinarily would be restricted to sheet making. Expectations are supply will tighten late in the third quarter when automotive and other consumers enter the market for sheets in a big way. Requirements for light plates should be heavier after the summer vacations.

Some buyers are inclined to withhold third quarter orders until the price matter is settled. Expectations are that plates will go up $8 to $10 a ton after July 1.

The 160-in. mill at the Claymont Products Department (Claymont, Del.), Colorado Fuel & Iron Corp., will go down at the end of this week for about a month so new housings can be installed.

Structural Shapes . . .

Structural Shape Prices, Page 168

While the structural fabricating shops are busy, it is at the expense of backlogs. Order books, especially of those fabricators not equipped to handle bridge work, are steadily losing ground in the East.

As a general thing, backlogs have not yet been reduced to the point that would increase fabricators' concern. All shops anticipate good second half operations. Some of them are booked well into next winter and, in a few instances, beyond.

Bridge contracts are heavier in New England, led by 7500 tons for Connecticut. Higher fabricating and plain material costs will be applicable on this tonnage, but going prices in the area do not yet reflect an uptrend. Power plant contracts for about 5500 tons have been placed.

In general, structural steel supply is a trifle easier. As a result,

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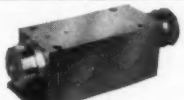

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Your State Director, Savings Bond Division, U. S. Treasury Department, will be glad to help you install The Payroll Savings Plan, or build participation in an existing plan. Write: Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

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fabricating shops are more competitive on new jobs. Users of wide flange beams think supply will be tighter in July because of production suspensions for vacations. Currently, though, the mills are meeting delivery promises better than they had been. Requirements for barges, and shipbuilding in general, are growing steadily.

Light angles and channels are in fairly free supply, but heavy angles and channels remain tight. Deliveries extend four weeks and more.

Pig Iron . . .

Pig Iron Prices, Page 173

Some foundries have closed for summer vacations. The majority of them will be down during the early part of July. Consequently, pig iron shipments are declining and are not expected to turn upward until late next month or early August.

Merchant iron consumers are buying cautiously and are watching their inventories closely. No substantial buying has been reported as a hedge against the price boost which may be posted in the third quarter.

Steel mills are using a high ratio of hot metal in their open-hearth melts because of the relatively high price for scrap.

Granite City Steel Co., Granite City, Ill., recently shipped three boatloads of iron for export.

No. 2 blast furnace at Jones & Laughlin's Aliquippa Works (Aliquippa, Pa.) was blown in on June 12. It had been out of production since Mar. 3 for relining and enlarging. The stack's capacity was raised to 1270 tons of iron daily, an increase of 370 tons.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 174

Production of coke during April totaled 6,440,263 net tons, reports the U.S. Bureau of Mines. Of this total, 6,221,182 tons were oven coke, and 219,081 tons were beehive. In March, output was 6,894,121 tons (6,631,662 oven, 262,459 beehive). Production in April, 1956, amounted to 6,631,233 tons (6,379,919 oven, 251,314 beehive).

In the calendar year 1957 through April, production totaled 26,406,122 net tons (25,423,140

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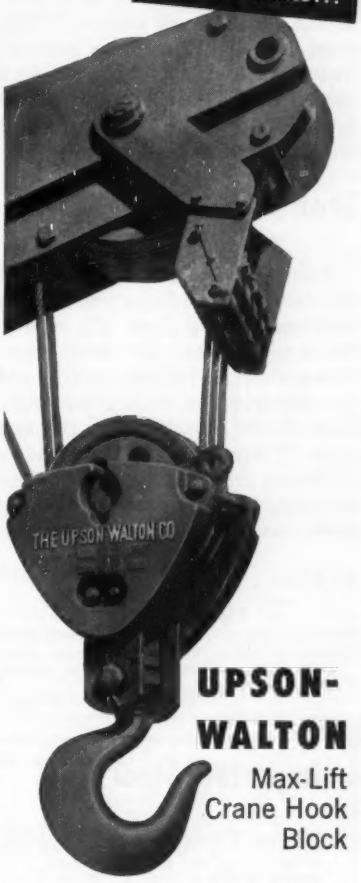

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oven, 982,982 beehive). This compares with 26,933,343 tons (25,423,140 oven, 1,032,458 beehive) in the like 1956 period.

Producers' stocks of oven coke at the end of April were 2,153,940 tons, equal to 10.4 days' output. They were 2,108,147 tons (9.9 days) at the end of March, and 1,742,772 tons (8.2 days) at the end of April, 1956.

Iron Ore . . .

Iron Ore Prices, Page 174

Shipments of Lake Superior iron ore totaled 3,065,383 gross tons in the week ended June 17, reports the American Iron Ore Association. Comparison: 3,106,506 were moved in corresponding week a year ago. Cumulative shipments through June 17 were 24,127,611 tons, down 1,239,916 from the 25,367,527 tons shipped to the same date in the 1956 navigation season.

PLATES . . .

PLATES PLACED

250 tons, Helena Valley pumping plant, Montana, to Great Falls Iron Works, Great Falls, Mont.; Misco Inc., Seattle, general contractor.

PLATES PENDING

500 tons, two 600,000-gal tanks (one elevated), housing project, Ft. George G. Meade, Md.; bids June 28, Corps of Engineers, Baltimore.

150 tons, 400,000-gal ground level water storage tank, Dugway Proving Grounds, Utah; bids June 28, Corps of Engineers, San Francisco.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4900 tons, superstructure-deck, 12-span plate girder bridge, Connecticut river, Windsor-Windsor Locks, Conn., to Ingalls Iron Works, Birmingham; Consolidated Builders Inc., North Attleboro, Mass., general contractor.

2600 tons, state bridge work, Mifflin county, Pennsylvania, to the Pine Brooke Iron Works, Scranton, Pa.

1370 tons, five grade separations and one stream crossing, Norwich, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Brunali Construction Co., Southington, Conn., and M. A. Gammino Construction Co., Providence, R. I., joint general contractors.

980 tons, bridge work, route 21, New Jersey; Franklin Contracting Co., Newark, N.J., low on general contract.

800 tons, state highway bridges, Reading-Woburn-Stoneham, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; J. F. White Contracting Co., Cambridge, Mass., and Consolidated Builders Inc., North Attleboro, Mass., joint general contractors.

520 tons, plate grider bridge, Shetucket river, Norwich, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Mariani Construction Co., New Haven, Conn., is general contractor.

475 tons, senior and junior high school, Honesdale, Pa., to the Anthracite Bridge Co., Scranton, Pa.

450 tons, state bridge work, Camden county, New Jersey, to the Ingalls Iron Works, Birmingham.

425 tons, state highway structures, including 3-span steel beam bridge, Concord-Hopkinton, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Frank Piazzi & Sons Inc., Johnston, R. I., general contractor.

375 tons, two bridge structures, including a 4-span 238-ft composite wide flange bridge, Vernon-Guilford, Vt., to Vermont Structural Steel Co., Burlington, Vt.; W. H. Hinman, North Anson, Me., general contractor.

300 tons, United Air Lines hangar addition, Seattle, to Isaacson Iron Works, Seattle; John H. Sellen Construction Co., Seattle, general contractor.

250 tons, Helena Valley, Mont., pumping plant, to Great Falls Iron Works, Great Falls, Mont.; Misco Inc., Seattle, general contractor.

250 tons, terminal shed, Seward, Alaska, for Alaska Railroad, to Isaacson Iron Works, Seattle; Warrack Construction Co., Seattle, general contractor.

130 tons, twin-span rolled beam bridge, Salisbury, Conn., to Haarmann Steel Co., Holyoke, Mass.; Charter Oak Construction Co., Hartford, Conn., general contractor.

STRUCTURAL STEEL PENDING

3365 tons, Anacostia bridge, Washington, D.C.; bids closed.

3315 tons, including 1805 tons of low alloy, girder bridge, Anacostia freeway over the P.B. & W. railroad yards, Washington, D.C.; also 425 tons, reinforcing bars.

2000 tons, power house, etc., Rocky Reach dam, Wenatchee, Wash.; bids in.

400 tons, dairy, Spokane, Wash.; bids in June 21.

400 tons, additions at atomic plant, Arco, Idaho; bids in.

350 tons, five state bridges, Marlborough-Colchester, Conn.; S. & M. Construction Co. Inc., Providence, R.I., low on general contract; also 285 tons, reinforcing.

330 tons, Carlton bridge widening and west approach, Bath-Woolwich, Me.; also 10,500 linear feet of steel H-beam piles.

325 tons, 2-span welded plate girder bridge, Greenwich, Conn.; Frouge Construction Co., Bridgeport, Conn., low on general contract; also 145 tons, reinforcing bars.

320 tons, 5-story steel frame addition, State College, Portland, Oreg.; A Young & Son Inc., Portland, apparently low at $68,995 base, plus $14,995 alternative.

120 tons, twin-span rolled beam bridge, Salisbury, Conn.; Charter Oak Construction Co. Inc., Hartford, Conn., low on general contract; also 75 tons of reinforcing bars.

REINFORCING BARS . . .

REINFORCING BARS PLACED

325 tons, Helena Valley pumping plant, Montana, to Barker Steel Co., Great Falls, Mont.; Misco Inc., Seattle, general contractor.

192 tons, housing project, air base, Glasgow, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle; Nelse Mortenson Co., Seattle, general contractor.

165 tons, Washington state, Whatcom county bridge, to Joseph T. Ryerson & Son Inc., Seattle; Lockyear & White, general contractor.

REINFORCING BARS PENDING

1600 tons, Washington state, Washington Narrows bridge; bids in.

685 tons, state highway work, route 102, section 2-A, route 28 (1927), Hunterdon county, New Jersey; bids July 2.

325 tons, substructure, girder, bridge, Anacostia freeway over P.B.&W. railroad yards, Washington, D.C.; also 3000 tons of carbon structural steel.

225 tons, substructure and highway, five state bridges, Windsor-Windsor Locks, Conn.; bids June 24, Hartford, Conn.; also 450 tons of mat reinforcement, and 27,820 feet of steel piles.

222 tons, Rogue river, Oreg., irrigation project; bids to the Bureau of Reclamation, July/August.

210 tons, two state highway bridges, Concord, N.H.

150 tons, also gates and miscellaneous, Howard Prairie canal, Rogue river project, Oregon; general contract by Bureau of Reclamation to Cherf Bros. & Sandkey, Epharata, Wash., and S. Birch & Sons, Seattle, joint low at $1,636,739.

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅝" Dia. incl. all extras)	$7.13	$7.36	$7.02	$6.76
Merchant Bars (¼" Round incl. all extras)..	7.67	7.90	7.53	7.27
Bands (1"x¼"x20' incl. all extras)	7.81	8.03	7.70	7.43
Angles (2"x2"x¼" incl. all extras)	6.77	7.00	7.21	6.93
Beams & Channels (base)	7.17	7.41	7.67	7.45
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	32.77	31.80
Barbed Wire (per 92 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)....	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras) ..	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')...	8.64	9.11	...	...
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	...	...
Tubing (2⅜", 6.4 J55, EUE, per 100')	103.00	104.00	...	...
Forged R. Turn. Bars, C-1035 (from 10" dl.)	14.00	14.23	14.00	13.74

Ask prices on: Bulb tees, bolts and nuts, coated and specialty strip, welded wire reinforcing mesh and hardware cloth, boiler tubes, API line pipe, A-335-P11 pressure pipe.

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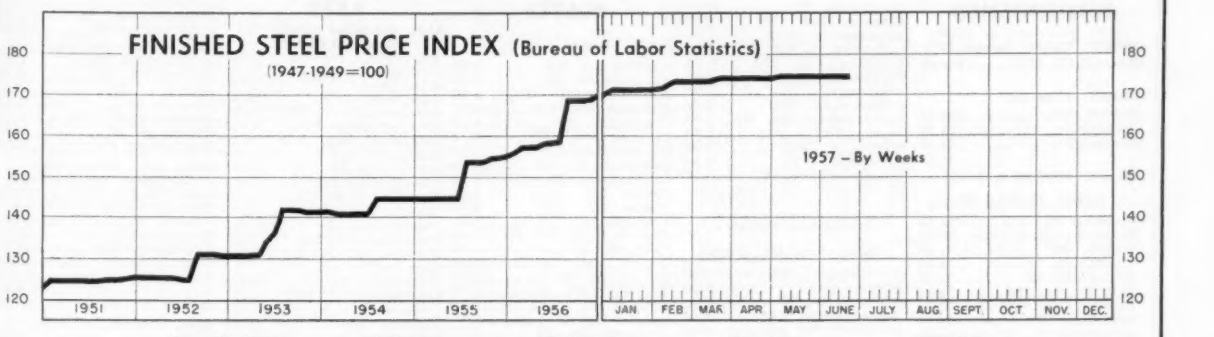
Price Indexes and Composites



June 18, 1957	Week Ago	Month Ago	May Avg.	Year Ago
174.3	174.3	174.4	174.4	158.2

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 18

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.350	Bars, Reinforcing	5.788
Rails, Light, 40 lb	6.817	Bars, C.F., Carbon	9.910
Tie Plates	6.275	Bars, C.F., Alloy	13.425
Axles, Railway	9.400	Bars, C.F., Stainless, 302 (lb)	0.533
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.942
Plates, Carbon	5.900	Sheets, C.R., Carbon	6.789
Structural Shapes	5.667	Sheets, Galvanized	7.990
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.660
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.475
Bars, H.R., Alloy	10.150	Strip, H.R., Carbon	5.995
Bars, H.R., Stainless, 303 (lb)	0.508	Pipe, Black, Buttweld (100 ft)	18.894
Bars, H.R., Carbon	6.075	Pipe, Galv., Buttweld (100 ft)	22.344
		Pipe, Line (100 ft)	190.108
		Casing, Oil Well, Carbon (100 ft)	185.565
		Casing, Oil Well, Alloy (100 ft)	290.203
		Tubes, Boiler (100 ft)	46.737
		Tubing, Mechanical, Carbon (100 ft)	23.713
		Tubing, Mechanical, Stainless, 304 (100 ft)	197.663
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	9.775
		Wire, Drawn, Stainless, 430 (lb)	0.630
		Bale Ties (bundle)	7.423
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.327
		Woven Wire Fence (20-rod roll)	20.560

STEEL's FINISHED STEEL PRICE INDEX*

	June 19 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	228.59	228.59	228.59	210.45	171.92
Index in cents per lb	6.193	6.193	6.193	5.701	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$140.24	$140.24	$140.24	$128.98	$106.32
No. 2 Fdry Pig Iron, GT	64.70	64.70	64.70	60.27	52.54
Basic Pig Iron, GT	64.23	64.23	64.23	59.80	52.16
Malleable Pig Iron, GT	65.77	65.77	65.77	61.27	53.27
Steelmaking Scrap, GT	55.67	55.67	46.67	46.00	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 19 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.365	5.365	5.365	4.93	4.252
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	6.25*	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.31	5.00	3.93
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.49	8.49	8.49	7.60	5.90-6.20
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.70

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, 7/32-5/8" Pitts.	5.80	5.80	5.80	5.375	4.10-4.30

PIG IRON, Gross Ton	June 19 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$65.50	$65.50	$65.50	$61.00	$53.00
Basic, Valley	64.50	64.50	64.50	60.00	52.00
Basic, deld., Phila.	68.38	68.38	68.38	63.76	56.75
No. 2 Fdry, NevilleIsland,Pa.	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, Chicago	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, deld., Phila.	68.88	68.88	68.88	64.26	57.25
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry(Birm.)deld.Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	65.00	65.00	65.00	60.50	52.50
Malleable, Chicago	65.00	65.00	65.00	60.50	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$56.50	$56.00	$45.50	$44.50	$44.00
No. 1 Heavy Melt, E. Pa.	56.50	56.50	52.00	47.50	42.50
No. 1 Heavy Melt, Chicago	54.00	54.00	42.50	46.00	42.50
No. 1 Heavy Melt, Valley	54.50	54.50	43.50	47.50	44.00
No. 1 Heavy Melt, Cleve.	51.50	51.50	38.50	45.50	43.00
No. 1 Heavy Melt, Buffalo	46.50	46.50	40.50	45.50	43.00
Rails, Rerolling, Chicago	74.50	66.50	61.50	67.50	52.50
No. 1 Cast, Chicago	48.50	46.50	42.50	45.50	45.00

COKE, Net Ton					
Beehive, Furn., Connisvl.	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry., Connisvl.	18.00	18.00	18.00	16.50	17.50

Steel Prices

Mill prices as reported to STEEL, June 19, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 169; to footnotes, page 171.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)
Detroit S41 .....$74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 ....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ....74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .....$91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 .....91.50
Houston S5 .....96.50
Johnstown,Pa. B2 ....91.50
Lackawanna,N.Y. B2 ..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14..91.50
S.Duquesne,Pa. U5 ...91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$107.00
Bridgeport,Conn. N19..107.00
Buffalo R2 .....107.00
Canton,O. R2, T7 ....107.00
Conshohocken,Pa. A3 .114.00
Detroit S41 .....107.00
Fontana,Calif. K1 ...128.00
Gary,Ind. U5 .....107.00
Houston S5 .....112.00
Ind.Harbor,Ind. Y1 ..107.00
Johnstown,Pa. B2 ...107.00
Lackawanna,N.Y. B2 .107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 ....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 .107.00
S.Duquesne,Pa. U5 ..107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 .....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2, W14.111.50
S.Duquesne,Pa. U5 ...111.50

SKELP
Aliquippa,Pa. J5 .....4.725
LoneStar,Tex. L6 .....5.025
Munhall,Pa. U5 .....4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ...4.625

WIRE RODS
AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston S5 .....6.05
IndianaHarbor,Ind. Y1 ..5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 .....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P17 ....5.80
N.Tonawanda,N.Y. B11..5.80
Pittsburg,Calif. C11 ...6.60
Portsmouth,O. P12 ....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 ....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.00
Atlanta A11 .....5.20
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.00
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.75
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston S5 .....5.10
Ind.Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 .....5.05
Joliet,Ill. P22 .....5.00
KansasCity,Mo. S5 .....5.10
Lackawanna,N.Y. B2 ...5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.65
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.75
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14..5.00
S.SanFrancisco B3 .....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 .....5.00

Wide Flange
Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.90
IndianaHarbor,Ind. I-2 ..5.25
Lackawanna,N.Y. B2 ...5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston S5 .....7.45
Ind.Harbor,Ind. I-2, Y1.7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 .....7.45
Lackawanna,N.Y. B2 ...7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 .....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.40
Lackawanna,N.Y. B2 ...7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ...5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky.(15) A10 ..4.85
Bessemer,Ala. T2 .....4.85
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 ..5.60
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 .....5.05
Harrisburg,Pa. P4 .....5.80
Houston S5 .....4.95
Ind.Harbor,Ind. I-2, Y1.4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. A2 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14..4.85
SparrowsPoint,Md. B2 ..4.85
Sterling,Ill. N15 .....4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Youngstown R2, U5, Y1.4.85

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.20
Fontana,Calif. K1 .....7.00
Geneva,Utah C11 .....6.25
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 .....11.95

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 .....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston S5 .....7.35
Ind.Harbor,Ind. I-2, Y1..7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14..7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy
Aliquippa,Pa. J5 .....6.85
Claymont,Del. C22 .....6.85
Coatesville,Pa. L7 .....6.85
Fontana,Calif.(30) K1 ..7.60
Gary,Ind. U5 .....6.85
Houston S5 .....6.95
Ind.Harbor,Ind. Y1 .....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. A2 .....6.85
Pittsburgh J5 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14..6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES
Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ...5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron
Ashland c.l. (15) A10..5.10
Ashland l.c.l. (15) A10..5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5....5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.275
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ....5.075
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa.(9) U5 ....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ....5.175
Emeryville,Calif. J7 ...5.825
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 ....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Houston(9) S5 .....5.325
Ind.Harbor(9) I-2, Y1..5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 ....5.075
LosAngeles(9) B3 ....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ....5.525
Niles,Calif. P1 .....5.775
N.T'wanda,N.Y.(9)B11 5.425
Pittsburg,Calif.(9) C11..5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.825
Seattle B3, N14 .....5.825
S.Ch'c'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5..5.075
S.SanFran.,Calif.(9)B3 5.825
Sterling,Ill.(1) N15 ....5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Tonawanda,N.Y. B12 ...5.45
Torrance,Calif.(9) C11..5.775
Youngstown(9) R2, U5..5.075

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.125
Bethlehem,Pa. B2 .....6.125
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2, T7 .....6.125
Clairton,Pa. U5 .....6.125
Detroit S41 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.125
Houston S5 .....6.375
Ind.Harbor,Ind. I-2, Y1..6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 .....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
Pittsburgh J5 .....6.125
S.Chicago R2,U5,W14 ..6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.425
Bessemer,Ala. T2 .....7.425
Bethlehem,Pa. B2 .....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.425
Houston S5 .....7.675
Ind.Harbor,Ind. Y1 ....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. S5 .....7.675
Lackawanna,N.Y. B2 ..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Duquesne,Pa. U5 ....7.425
S.Chicago,Ill. U5, W14..7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.225
Houston(9) S5 .....5.325
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 ....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ...5.075
Tonawanda,N.Y. B12 ...5.45

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.075
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco S7 .....5.95

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.45
KansasCity,Mo. S5 ....6.45
Pittsburgh J5 .....6.20
Youngstown U5 .....6.20

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.35
Monaca,Pa. S17 .....9.475
Newark,N.J. W18 .....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....6.85
BeaverFalls,Pa. M12,R2.6.85
Birmingham C15 .....7.45
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 .....6.85
Detroit B5, P17 .....7.05
Detroit S41 .....6.85
Donora,Pa. A7 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ...6.85
Gary,Ind. R2 .....6.85
GreenBay,Wis. F7 .....6.85
Hammond,Ind. L2, M13..6.85
Hartford,Conn. R2 .....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles R2 .....8.75
LosAngeles P2 .....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ...6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4...6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 ....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 .....6.85
SpringCity,Pa. K3 .....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.6.10

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa. M12,R2 8.325
Bethlehem,Pa. B2 .....8.325
Bridgeport,Conn. N19 ..8.475
Buffalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....8.325
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit S41 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 .....8.325
Hammond,Ind. L2,M13.8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles S30 .....10.10
LosAngeles P2 .....10.20
Mansfield,Mass. B5 ...8.625
Massillon,O. R2, R8 ...8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 .....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ...8.625
Youngstown F3, Y1 ...8.325

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.275
Birmingham C15 .....5.075
Bridgeport,Conn. N9 ...5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ..5.825

Fairfield,Ala. T2 ....5.075
Fairless,Pa. U5 .....5.225
Fontana,Calif. K1 ....5.775
Ft.Worth,Tex.(4) T4 ..5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.775
Pittsburg,Calif. C11 ...5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 ....5.825
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 .....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint, Md. B2.5.075
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Tonawanda,N.Y. B12 ..5.65
Torrance,Calif. C11 ...5.775
Youngstown R2, U5 ...5.075

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.30
Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2 6.73
KansasCity,Mo. S5 ....7.00
Lackawanna,N.Y. B2 ..6.50
Marion,O. P11 .....6.70
NewYork U8 .....7.20
Pittsburgh J5, U8 ....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ¼-1" B2 ..6.73
Williamsport,Pa. S19 ..6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.075
ChicagoHts.(4)(44) I-2 5.075
ChicagoHts.(4) C2 ....5.075
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(3) F5 ....5.10
Franklin,Pa.(4) F5 ...5.075
JerseyShore,Pa.(4) J8 ..5.10
Marion,O.(3) P11 .....5.10
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 ....5.15
Tonawanda(4) B12 ....5.65
Williamsport,Pa.(3) S19.5.15

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 13.15
Economy,Pa.(D.R.)B14 16.35
Economy(Staybolt)B14. 16.80
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5 19.15

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ...4.675
Cleveland J5, R2, ...4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....4.675
Geneva, Utah C11 .....4.775
GraniteCity,Ill.(8) G4..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Irvin,Pa. U5 .....4.675
Lackawanna,N.Y. B2..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) A2 ....4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ...5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ...4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
Irvin,Pa. U5 .....7.75
Newport,Ky. A2 .....7.75
Youngstown U5, Y1 ....7.75

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2.....6.90
Conshohocken,Pa. A3 ..6.95
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 ....7.75
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1.6.90
Irvin,Pa. U5.....6.90
Lackawanna(35) B2 ...6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 .....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....5.425
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 ...5.80
Detroit M1 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 .....5.95
Ind.Harbor,Ind. I-2, Y1.5.75
Irvin,Pa. U5 .....5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middeltown,O. A10 ....5.75
Newport,Ky. A2 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
SparrowsPoint,Md. B2 ..5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 .....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 .....9.775
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1..8.525
Irvin,Pa. U5 .....8.525
Lackawanna(37) B2 ..8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2.8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.65	6.90
Canton,O. R2	.6.65	7.15
Fairfield T2	.6.65	6.90
Gary,Ind. U5	.6.65	6.90
GraniteCity,Ill. G4	6.85	...
Ind.Harbor I-2	.6.65	6.90
Irvin,Pa. U5	.6.65	6.90
Kokomo,Ind. C16	.6.75	...
MartinsFry. W10	.6.65	6.90
Pittsburgh J5	.6.65	...
Pitts.,Calif. C11	.7.40	...
SparrowsPt. B2	.6.65	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50•
Ind.Harbor,Ind. I-2 ...6.30†
Irvin,Pa. U5 .....6.30†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30•
Middletown,O. A10 ...6.30†
Pittsburg,Calif. C11 ...7.05•
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ...6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30•

•Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 .....7.025

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Irvin,Pa. U5 .....6.70

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.95
Butler,Pa. A10 (type 2).9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Irvin,Pa. U5 .....6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.35
Ind.Harbor,Ind. I-2 ...8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 ....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 .....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo.Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J.Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division, Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Dawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U5 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel&Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.675
Allenport,Pa. P7 .....4.675
Alton,Ill. L1 .....4.875
Ashland,Ky.(8) A10 ...4.675
Atlanta A11 .....4.875
Bessemer,Ala. T2 .....4.675
Birmingham C15 .....4.675
Buffalo(27) R2 .....4.675
Conshohocken,Pa. A3 ..4.725
Detroit M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....4.675
Houston S5 .....4.925
Ind.Harbor,Ind. I-2, Y1 4.675
Johnstown,Pa.(25) B2..4.675
KansasCity,Mo. S5 ....4.925
Lackaw'na,N.Y.(25) B2 4.675
LosAngeles(25) B3 ....5.425
Minnequa,Colo. C10 ....5.775
Pittsburg,Calif. C11 ...5.425
Riverdale,Ill. A1 .....4.675
SanFrancisco S7 .....5.95
Seattle(25) B3 .....5.675
Seattle N14 .....5.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
S.SanFrancisco(25) B3 5.425
SparrowsPoint,Md. B2..4.675
Sterling,Ill.(1) N15 ...4.675
Sterling Ill. N15 .....4.775
Torrance,Calif. C11 ...5.425
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5 .....4.675

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....7.75
Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
LosAngeles B3 .....8.95
Newport,Ky. A2 .....7.75
Sharon Pa. S3 .....7.75
S.Chicago,Ill. W14 .....7.75
Youngstown U5, Y1.....7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2 .....6.95
Conshohocken,Pa. A3 ..6.95
Ecorse,Mich. G5 .....7.05
Fairfield,Ala. T2 .....6.95
Gary,Ind. U5 .....6.95
Houston S5 .....7.20
Ind.Harbor,Ind. I-2, Y1.6.95
KansasCity,Mo. S5 ....7.20
Lackawanna,N.Y. B2 ..6.95
LosAngeles(25) B3 .....7.70
Seattle(25) B3 .....7.95
Sharon,Pa. S3 .....6.95
S.SanFrancisco(25) B3 ..7.70
SparrowsPoint,Md. B2 ..6.95
Warren O. R2 .....6.95
Weirton,W.Va. W6 .....6.95
Youngstown U5, Y1 ....6.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.925
Warren,O. R2 .....5.425

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....6.85
Baltimore T6 .....6.85
Boston T6 .....7.40
Buffalo S40 .....6.85
Cleveland A7, J5 .....6.85
Conshohocken,Pa. A3 ..6.90
Dearborn Mich. D3 ....6.95
Detroit D2, M1, P20 ...6.95
Dover,O. G6 .....6.85
Ecorse,Mich. G5 .....6.95
Evanston,Ill M22 .....6.95
Follansbee,W.Va. F4 ...6.85
Fontana,Calif. K1 .....8.70
FranklinPark,Ill. T6 ...6.95
Ind.Harbor,Ind. Y1 ....6.85
Indianapolis C8 .....7.00
LosAngeles C1 .....8.90
NewBedford,Mass. R10..7.30
NewBritain(10) S15 ....6.85
NewCastle,Pa. B4, E5 ..6.85
NewHaven,Conn. D2 ...7.30
NewKensington,Pa. A6..6.85
Pawtucket,R.I. P3 .....7.50
Pawtucket,R.I. N8 .....7.40
Pittsburgh J5 .....6.85
Riverdale,Ill. A1 .....6.95
Rome,N.Y.(32) R6 .....6.95
Sharon,Pa. S3 .....6.85
Trenton,N.J.(31) R5 ...8.30
Wallingford,Conn. W2...7.30
Warren O. R2, T5 .....6.85
Weirton W Va. W6 .....6.85
Worcester,Mass. A7 ....7.40
Youngstown C8, Y1 ....6.85

STRIP, Cold-Rolled Alloy

Boston T6 .....14.90
Carnegie,Pa. S18 .....14.55
Cleveland A7 .....14.55
Dover,O. G6 .....14.55
FranklinPark,Ill. T6 ..14.55
Harrison,N.J. C18 .....14.55
Indianapolis C8 .....14.70
Pawtucket,R.I. N8 ....14.90
Sharon,Pa. S3 .....14.55
Worcester,Mass. A7 ...11.85
Youngstown C8 .....14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.00
Dearborn,Mich. D3 ....10.10
Dover,O. G6 .....10.10
Ecorse,Mich. G5 .....10.10
Ind.Harbor,Ind. Y1 ....10.20
Sharon,Pa. S3 .....10.00
Warren,O. R2 .....10.00
Weirton,W.Va. W6 ....10.00
Youngstown Y1 .....10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.20	10.40	12.60	15.60	18.55
Boston T6	9.20	10.40	12.60	15.60	18.55
Bristol Conn. W1	....	10.40	12.60	15.60	18.55
Carnegie,Pa. S18	8.65	10.10	12.30	15.30	....
Cleveland A7	8.65	10.10	12.30	15.30	18.25
Cleveland C7	....	10.10	12.30	15.30	18.25
Dearborn,Mich. D3	8.75	10.20	12.40	....	....
Detroit D2	8.75	10.20	12.40	15.40	....
Dover,O. G6	8.65	10.10	12.30	15.30	18.25
Evanston,Ill M22	8.65	10.10	12.30	....	....
FranklinPark,Ill. T6	8.75	10.10	12.30	15.30	18.25
Harrison,N.J. C18	....	....	12.60	15.60	18.55
Indianapolis C8	8.80	10.25	12.30	15.30	18.25
LosAngeles C1	10.85	12.30	14.50	....	....
NewBritain,Conn.(10) S15.	8.65	10.10	12.30	15.30	18.25
NewCastle,Pa. B4, E5	8.65	10.10	12.30	15.30	....
NewHaven,Conn. D2	9.10	10.40	12.60	15.60	....
NewKensington,Pa. A6	8.65	10.10	12.30	15.30	....
New York W3	....	10.40	12.60	15.60	18.55
Pawtucket,R.I. N8	9.20	10.40	12.60	15.60	18.55
Riverdale,Ill. A1	8.75	10.10	12.30	15.30	18.25
Rome N.Y.(32) R6	8.65	10.10	12.30	15.30	18.25
Sharon,Pa. S3	8.65	10.10	12.30	15.30	18.25
Trenton,N.J R5	....	10.40	12.60	15.60	18.55
Wallingford,Conn. W2	9.10	10.40	12.60	15.60	18.45
Warren,O. T5	8.65	10.10	12.30	15.30	18.25
Worcester,Mass. A7, T6	9.20	10.40	12.60	15.60	18.55
Youngstown C8	8.65	10.10	12.30	15.30	18.25

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	17.10	20.95	25.30
Buffalo W12	17.10	....	....
FranklinPark,Ill. T6	17.45	21.30	25.65
Harrison,N.J. C18	17.10	20.95	25.30
New York W3	17.10	20.95	25.30
Palmer Mass. W12	17.10	....	....
Trenton,N.J. R5	17.10	20.95	25.30
Worcester,Mass. A7, T6	17.10	20.95	25.30
Youngstown C8	17.45	21.30	25.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.60

STRIP, C.R. Electrogalvanized

Cleveland A7 .....6.85*
Dover,O. G6 .....6.85*
Evanston,Ill. M22 .....6.95
Riverdale,Ill. A1 .....6.95*
Warren,O. B9, T5 ....6.85*
Worcester,Mass. A7 ...7.40*
Youngstown C8 .....6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....6.975

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.40
Riverdale,Ill. A1 .....5.25
Sharon,Pa. S3 .....5.10
Youngstown U5 .....5.10

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.00	12.05	13.05
Brackenridge,Pa. A4	....	....	11.00	12.05	13.05
Mansfield,O. E6	9.20	10.35	11.00	12.05	13.05
Newport,Ky. A2	9.20	10.35	11.00	12.05	13.05
Niles,O. M21	9.20	10.35	11.00	12.05	....
Vandergrift,Pa. U5	....	10.35	11.00	12.05	13.05
Warren,O. R2	9.20	10.35	11.00	12.05	....
Zanesville,O. A10	....	10.35	11.00	12.05	13.05
Zanesville,O. A10 (FP coils)	....	10.85	11.525	12.575	13.55
Zanesville,O. A10 (SP coils)	....	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	11.525	12.575	13.55
GraniteCity,Ill. G4	9.40*	10.55*	11.225*†	12.275*	....
IndianaHarbor,Ind. I-2	9.20†	10.35*	11.025*†	12.075*	....
Mansfield,O. E6	9.20	10.35	11.525	12.575	13.55
Vandergrift,Pa. U5	9.20*	10.35*	11.025*†	12.075*	13.05*
Vandergrift,Pa. U5	....	....	10.85†‡	11.525†‡	12.575†‡	13.55†‡
Warren,O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge,Pa. A4	14.05	....	....	....
Vandergrift,Pa. U5	14.05	14.60	15.10	16.15
Zanesville,O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	16.90	18.50	19.00	19.50	....
Butler,Pa. A10	....	....	....	18.50	19.00	19.50	....
Vandergrift,Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren,O. R2	....	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)	7.425	7.625	....
Aliquippa,Pa. J5	7.425	7.625	7.925
Niles,O. R2			

TINPLATE, Americon	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$7.85
Fairfield,Ala. T2 .....7.95
Fairless,Pa. U5 .....7.95
Fontana,Calif. K1 .....8.60
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 .....7.95
Ind.Harbor,Ind. I-2, Y1.7.85
Irvin,Pa. U5 .....7.85
Niles,O. R2 .....7.85
Pittsburg,Calif. C11 ....8.60
SparrowsPoint,Md. B2 ..7.95
Weirton,W.Va. W6 .....7.85
Yorkville,O. W10 .....7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....$7.50
Gary,Ind. U5 .....7.50
GraniteCity Ill. G4 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Irvin,Pa. U5 .....7.50
Yorkville,O. W10 .....7.50

MANUFACTURING TERNES (Special Coated Base Box)

Gary,Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..7.20
Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.40
Atlanta A11 .....7.40
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Chicago W13 .....7.20
Cleveland A7, C20 .....7.20
Crawfordsville Ind. M8..7.30
Donora,Pa. A7 .....7.20
Duluth A7 .....7.20
Fairfield,Ala. T2 .....7.20
Fostoria,O.(24) S1 .....7.30
Houston S5 .....7.45
Jacksonville,Fla. M8 ...7.55
Johnstown,Pa. B2 .....7.20
Joliet,Ill. A7 .....7.20
KansasCity,Mo. S5 .....7.45
Kokomo,Ind. C16 .....7.30
LosAngeles B3 .....8.15
Minnequa,Colo. C10 ....7.45
Monessen Pa. P7, P16...7.20
N.Tonawanda,N.Y. B11.7.20
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Rankin,Pa. A7 .....7.20
S.Chicago,Ill. R2 .....7.20
S.SanFrancisco C10 ....8.15
SparrowsPoint,Md. B2 ..7.30
Sterling,Ill.(1) N15 .....7.20
Sterling,Ill. N15 .....7.30
Struthers,O. Y1 .....7.20
Waukegan,Ill. A7 .....7.20
Worcester,Mass. A7 ....7.50

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 ....11.90
Buffalo W12 .....11.90
Cleveland A7 .....11.90
Donora,Pa. A7 .....11.90
Duluth A7 .....11.90
Johnstown,Pa. B2 .....11.90
Minnequa,Colo. C10 ..12.025
Monessen,Pa. P16 .....11.90
Muncie,Ind. I-7 .....12.10
NewHaven,Conn. A7 ..12.20
Palmer,Mass. W12 .....12.20
Pittsburg Calif. C11 ....12.70
Portsmouth,O. P12 ....11.90
Roebling,N.J. R5 .....12.20
SparrowsPt.,Md. B2 ...12.00
Struthers,O. Y1 .....11.90
Trenton,N.J. A7 .....12.20
Waukegan,Ill. A7 .....11.90
Worcester,Mass. A7 ...12.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....8.70
Alton,Ill. L1 .....8.90
Buffalo W12 .....8.70
Cleveland A7 .....8.70
Donora,Pa. A7 .....8.70
Duluth A7 .....8.70
Johnstown Pa. B2 .....8.70
KansasCity,Mo. S5 .....8.95
Minnequa,Colo. C10 ....8.90
LosAngeles B3 .....9.65
Monessen,Pa. P7, P16..8.70
NewHaven,Conn. A7 ...9.00
Palmer,Mass. W12 .....9.00
Pittsburg,Calif. C11 ....9.65
Portsmouth,O. P12 ....8.70
Roebling N.J R5 .....9.00
S.Chicago,Ill. R2 .....8.70
S.SanFrancisco C10 ....9.65
SparrowsPt.,Md. B2 ...8.80
Struthers,O. Y1 .....8.70
Trenton,N.J. A7 .....9.00
Waukegan,Ill. A7 .....8.70
Worcester,Mass. A7 ....9.00

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....9.025
Alton,Ill. L1 .....9.225
Bartonville Ill. K4 .....9.125
Buffalo W12 .....9.025
Cleveland A7 .....9.025
Donora,Pa. A7 .....9.025
Duluth A7 .....9.025
Fostoria,O. S1 .....9.075
Johnstown,Pa. B2 .....9.025
LosAngeles B3 .....9.975
Milbury Mass.(12) N8..9.325
Minnequa,Colo. C10 ...9.275
Monessen,Pa. P7, P16..9.025
Muncie,Ind. I-7 .....9.225
Palmer,Mass. W12 .....9.325
Pittsburg,Calif. C11 ....9.975
Portsmouth,O. P12 ....9.025
Roebling,N.J R5 .....9.325
S.Chicago,Ill. R2 .....9.025
S.SanFrancisco C10 ....9.975
SparrowsPt.,Md. B2 ....9.125
Struthers,O. Y1 .....9.025
Trenton,N.J. A7 .....9.325
Waukegan,Ill. A7 .....9.025
Worcester J4, T6, W12.9.325
Worcester,Mass. A7 ...9.325

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....14.65
Bartonville, Ill. K4 ... 14.55
Buffalo W12 .....14.45
Chicago W13 .....14.45
Cleveland A7 .....14.45
Crawfordsville,Ind. M8.14.25
Fostoria,O. S1 .....14.45
Jacksonville,Fla. M8 ..14.50
Johnstown Pa. B2 .....14.45
Kokomo,Ind. C16 .....14.45
Monessen,Pa. P7 .....14.45
Muncie,Ind. I-7 .....14.65
Palmer,Mass. W12 .....14.75
Roebling,N.J. C10 .....14.45
S.SanFrancisco C10 ....14.80
Waukegan,Ill. A7 .....14.45
Worcester,Mass. A7, T6.14.75

ROPE WIRE

Bartonville,Ill. K4 .....12.00
Buffalo W12 .....12.00
Fostoria,O. S1 .....12.00
Johnstown Pa. B2 .....12.00
Monessen,Pa. P7 .....12.00
Muncie Ind. I-7 .....12.20
Palmer,Mass. W12 .....12.30
Portsmouth,O. P12 ....12.00
Roebling,N.J. R5 .....12.30
SparrowsPt.,Md., B2 ..12.10
Struthers,O. Y1 .....12.00
Worcester,Mass. J4 ....12.30

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.75
Monessen,Pa. P16	15.45
Roebling,N.J. R5	16.10

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Chicago W13	10.85
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	11.05
Franklin Park,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES,

Stock	Col.
AlabamaCity,Ala. R2	164
Aliquippa,Pa. J5	164
Atlanta A11	166
Bartonville,Ill. K4	166
Crawfordsville,Ind. M8	166
Donora,Pa. A7	164
Duluth A7	164
Fairfield Ala. T2	164
Houston,Tex. S5	169
Jacksonville,Fla.(20) M8	175
Johnstown,Pa. B2	164
Joliet,Ill. A7	164
KansasCity,Mo. S5	169
Kokomo,Ind. C16	166
Minnequa,Colo. C10	169
Monessen,Pa. P7	164
Pittsburg,Calif. C11	183
Rankin,Pa. A7	164
S.Chicago Ill. R2	164
SparrowsPt.,Md. B2	166
Sterling,Ill.(7) N15	166
Worcester,Mass. A7	170

NAILS, Stock

	Col.
Chicago W13	164
Cleveland A9	170

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.82
Atlanta A11	9.63
Bartonville,Ill. K4	9.63
Buffalo W12	9.82
Chicago W13	9.82
Crawfordsville,Ind. M8	9.63
Donora,Pa. A7	9.82
Duluth A7	9.82
Fairfield,Ala. T2	9.82
Houston S5	10 07
Jacksonville,Fla. M8	10.09
Johnstown,Pa. B2	9.82
Joliet,Ill. A7	9.82
KansasCity,Mo. S5	10.07
Kokomo,Ind. C16	9.92
LosAngeles B3	10.61
Minnequa,Colo. C10	10.07
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.82
S.SanFrancisco C10	10.60
SparrowsPt.,Md. B2	9.92
Sterling,Ill.(37) N15	9.82

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.15
Atlanta A11	9.95
Bartonville,Ill. K4	9.95
Buffalo W12	10.15
Chicago W13	10.15
Crawfordsville,Ind. M8	9.95
Donora,Pa. A7	10.15
Duluth A7	10.15
Fairfield,Ala. T2	10.15
Houston S5	10.40
Jacksonville Fla. M8	10.41
Johnstown,Pa. B2	10.15
Joliet,Ill. A7	10.15
KansasCity,Mo. S5	10.40
Kokomo,Ind. C16	10.25
LosAngeles B3	10.95
Minnequa Colo. C10	10.40
Pittsburg Calif. C11	10.95
S.Chicago,Ill. R2	10.15
S.SanFrancisco C10	10.95
SparrowsPt.,Md. B2	10.25
Sterling,Ill.(37) N15	10.15

Coil Interim

AlabamaCity,Ala. R2	$10.20
Atlanta A11	10.00
Bartonville,Ill. K4	10 00
Buffalo W12	10.20
Chicago W13	10.20
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	10.20
Duluth A7	10.20
Fairfield,Ala. T2	10.20
Houston S5	10.45
Jacksonville,Fla. M8	10 46
Johnstown,Pa. B2	10.20
Joliet,Ill. A7	10.20
KansasCity,Mo. S5	10 45
Kokomo,Ind. C16	10.30
LosAngeles B3	11.00
Minnequa,Colo. C10	10.45
Pittsburg,Calif. C11	11.00
S.Chicago Ill. R2	10 20
S.SanFrancisco C10	11 00
SparrowsPt.,Md. B2	10.30
Sterling,Ill.(37) N15	10.20

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	196
Atlanta A11	192
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	196
Duluth A7	196
Fairfield,Ala. T2	196
Houston S5	201
Jacksonville,Fla. M8	197
Joliet,Ill. A7	190
KansasCity,Mo. S5	201
Kokomo,Ind. C16	198
Minnequa,Colo. C10	201
Pittsburg,Calif. C11	220
S.SanFrancisco C10	220
Sterling,Ill.(7) N15	196
SparrowsPt.,Md. B2	198
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	184††
Aliquippa,Pa. J5	181§
Atlanta A11	190*
Bartonville,Ill. K4	190
Crawfordsville,Ind. M8	190
Donora,Pa. A7	184†
Duluth A7	184†
Fairfield,Ala. T2	184†
Houston,Tex. S5	189**
Jacksonville,Fla. M8	195
Johnstown,Pa. B2	188*
Joliet,Ill. A7	184†
KansasCity,Mo. S5	189**
Kokomo,Ind. C16	186†
Minnequa,Colo. C10	189**
Monessen,Pa. P7	188*
Pittsburg,Calif. C11	204†
Rankin,Pa. A7	184†
S.Chicago Ill. R2	184**
S.SanFrancisco C10	204**
SparrowsPoint,Md. B2	190*
Sterling,Ill.(7) N15	190*

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	176**
Aliq'ppa,Pa. 9-14½ga.J2	179§
Atlanta A11	182*
Bartonville,Ill. K4	182
Crawfordsville,Ind. M8	182
Donora,Pa. A7	176†
Duluth A7	176†
Fairfield,Ala. T2	176†
Houston,Tex. S5	181**
Jacksonville,Fla. M8	187
Johnstown,Pa.(43) B2	180*
Joliet,Ill. A7	176†
KansasCity,Mo. S5	181**
Kokomo,Ind. C16	178†
Minnequa,Colo. C10	181**
Monessen,Pa. 9 ga. P7	180*
Pittsburg,Calif. C11	199†
Rankin,Pa. A7	176†
S.Chicago,Ill. R2	176**
Sterling,Ill.(7) N15	182*

WIRE (16 gage)

	Stone	Stone
Ala.City,Ala.R2	16.00	17.55**
Aliq'ppa Pa.	J5.15.70	17.50
Bartonville K4	15.80	17.75
Cleveland A7	16.00	....
Crawf'dsville M8	15 80	17.75
Fostoria,O. S1	16 50	18.05†
Houston S5	16.25	17.80**
Jacksonville M8	16 05	18.00
Johnstown B2	16 00	17.95*
Kan.City,Mo. S5	16 25	....
Kokomo C16	16 10	17.65†
Minnequa C10	16 25	17.80*
P'im'r,Mass.W12	16 30	17.85†
Pitts.,Calif. C11	16.35	17.90†
SparrowsPt.	B2.16 10	18.05*
Sterling(37)	N15 16.00	17 95*
Waukegan A7	16.00	17.55†
Worcester A7	16.30	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala.	R2.8.20	8.75**
Aliquippa J5	7.95	8.475§
Atlanta(48) A11	8.05	8.65*
Bartonville(48) K4.	8.05	8.65
Buffalo W12	8.20	8.75†
Cleveland A7	8.20	....
Crawfordsville M8.	8.05	8.65
Donora,Pa. A7	8.20	8.75†
Duluth A7	8.20	8.75†
Fairfield T2	8.20	8.75†
Houston(48) S5	8.45	9.00**
Jacks'ville,Fla. M8.	8.30	8.90
Johnstown B2(48)	8.20	8.95*
Joliet,Ill. A7	8.20	8.75†
Kans.City(48) S5.	8.45	9.00**
Kokomo C16	8.30	8.85†
LosAngeles B3	9.15	9.90*
Minnequa C10	8.45	9.00‡
Monessen P7(48).	7.95	8.55*
Palmer,Mass. W12	8.50	9.05†
Pitts.,Calif. C11	9.15	9.70†
Rankin,Pa. A7	8.20	8.75†
S.Chicago R2	8.20	8.75**
S.SanFran. C10	9.15	9.70*
Spar'waPt. B2(48)	8.30	9.05*
Sterling(37)(48)	N15 8.35	9.10
Struth'rs,O.(48)	Y1 8.20	8.85‡
Worcester,Mass.	A7 8.50	9.05†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††13c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	52.5
Longer than 6 in.	43.5
⅝ in. thru 1 in.:	
6 in. and shorter	43.5
Longer than 6 in.	41.5
1¼ in. and larger:	
All lengths	41.5

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	52.5

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	32.0
Longer than 6 in.	19.0
⅝ in. thru 1 in.:	
6 in. and shorter	16.0
Longer than 6 in.	16.0
1⅛ in. and larger:	
All lengths	16.0

Lag Bolts

All diameters:	
6 in. and shorter	52.5
Longer than 6 in.	44.5

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	52.0
Larger than ½ in. or longer than 6 in.	44.5

Blank Bolts 44.5

Step, Elevator, Tire Bolts 52.0

Stove Bolts, Slotted

⅛ to ¼-in. incl., 3 in. and shorter	54.00
⅛ to ½-in., inclusive	54.00

NUTS

Reg. & Heavy Square Nuts:

All sizes	58.0

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	44.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

⅜ in. and smaller	61.5
⅞ in. to 1 in., incl.	57.5
1⅛ in. to 1½ in., incl.	62.5
1⅝ in. and larger	56.0

Hex Nuts, Reg. & Heavy, Cold Punched:

⅜ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, All Types, Hot Galvanized:

⅜ in. and smaller	48.0
⅞ in. to 1 in., incl.	44.0
1⅛ in. to 1½ in., incl.	49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

⅜ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	64.00
1¼ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

Semifinished Hex Nuts, Reg. (Including Slotted):

⅝ in. and smaller	61.5
¾ in. to 1-in., incl.	64.0
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	44.0
¾, ⅞ and 1 in. diam.	27.0

Longer than 6 in.:

⅝ in. and smaller	14.0
¾, ⅞ and 1 in. diam.	0.5

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	31.0
¾, ⅞ and 1 in. diam.	9.0

Longer than 6 in.:

⅝ in. and smaller	+6
¾, ⅞ and 1 in. diam.	+24

Flat Head Capscrews:

¼ in. and smaller	+65.0

Setscrews, Square Head, (up Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 11.50

⅞-in. under List less 23%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	24.55	23.54
1¼	13	....	29.07	23.36
1½	13	27.45	32.14	25.83
1¾	13	32.43	37.97	30.51
2	13	36.34	42.56	34.20
2¼	13	40.93	47.94	38.52
2¼	12	44.42	52.03	41.81
2½	12	48.94	57.31	46.05
2¾	12	52.99	62.05	49.88
3	12	56.51	66.18	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.275	5.175	5.225	6.25
Ensley,Ala. T2	5.275	5.175	....	6.25
Fairfield,Ala. T2	....	....	....	6.25
Huntington,W.Va. C15	....	....	....	6.25
Gary Ind. U5	5.275	5.175	5.225	...
IndianaHarbor,Ind. I-2	5.275	5.175	5.225	...
Johnstown Pa. B2	....	....	...(16)	6.25
Lackawanna,N.Y. B2	5.275	5.175	....	6.25
Minnequa,Colo. C10	5.275	5.175	....	6.75
Steelton,Pa. B2	5.275	5.175	....	...
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.275
Gary,Ind. U5	6.275
Ind Harbor,Ind. I-2	6.275
Lackawanna,N.Y. B2	6.275
Minnequa,Colo. C10	6 275
Seattle B3	6 425
Steelton,Pa. B2	6.275
Torrance,Calif. C11	6.425

JOINT BARS

Bessemer,Pa. U5	6.60
Fairfield,Ala. T2	6 60
Ind Harbor Ind. I-2	6 60
Joliet,Ill. U5	6 60
Lackawanna,N.Y. B2	6 60
Minnequa,Colo. C10	6.60
Steelton,Pa. B2	6.60

AXLES

Ind Harbor,Ind. S13	8.35
Johnstown,Pa. B2	8.35

TRACK BOLTS, Untreated

Cleveland R2	13.85
KansasCity,Mo. S5	13.85
Lebanon,Pa. B2	13.85
Minnequa,Colo. C10	13.85
Pittsburgh P14	13.10
Seattle B3	14.35

SCREW SPIKES

Lebanon,Pa. B2	13.60
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.225
Ind.Harbor,Ind. I-2, Y1	9.225
KansasCity,Mo. S5	9 225
Lebanon,Pa. B2	9.225
Minnequa,Colo. C10	9.225
Pittsburgh J5	9.225
Seattle B3	9.725
S.Chicago,Ill. R2	9.225
Struthers,O. Y1	9.225
Youngstown R2	9.225

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6 23c; 1 15/16 to 4 in.; inclusive, 6.60c.
(6) Chicago or Birm base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 in and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(28) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bond-rized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0 45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in. and under by 0 125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9 60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.35c higher.
(41) 9 10c for cut lengths.
(42) Mill lengths, f.o.b. mill; d-l-d in mill zone or within switching limits, 5.685c.
(43) 9 14½ Ga.
(44) To fabricators.
(48) 6 7 Ga
(49) 3½-in. and smaller rounds; 8 65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25
Ambridge, Pa. N2	+5.25	....	1.25	....	3.75	....	5.25	....	5.25	....	5	....	7.5	....
Lorain, O. N3	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25
Youngstown Y1	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Alton, Ill. L1	....	....	....	....	....	....	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Benwood, W. Va. W10.	6.5	+20	+4.75	+28.25	+14.75	+36.25	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Butler, Pa. F6	7.5	+19	+3	+26.5	+12.5	+34	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Fairless, Pa. N3	....	....	....	....	....	....	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Fontana, Calif. K1	....	....	....	....	....	....	3.75	+19	+0.75	+15	2.75	+10.5	5.25	+9.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	8.25	+7	11.25	+3	14.75	1.5	17.25	0.75
Lorain, O. N3	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Sharon, Pa. S4	6.5	+20	+4	+27.5	+13.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Sparrows Pt., Md. B2	5.5	+21	+0.5	+28.5	+14.5	+36	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Wheatland, Pa. W9	7.75	+19	+3	+26.5	+12.5	+34	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Youngstown R2, Y1	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Alton, Ill. L1	16.75	2.25	17.25	3.75	18.75	2.5	18.75	2.5	....	....	....	....
Benwood, W. Va. W10	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Etna, Pa. N2	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Fairless, Pa. N3	16.75	2.25	17.25	3.75	18.75	2.5	18.75	2.5	8.25	+8.5	8.25	+8.5
Fontana, Calif. K1	5.75	+8.75	6.25	+8.25	7.75	+8.5	7.75	+8.5	+2.75	+19.5	+2.75	+19.5
Indiana Harbor, Ind. Y1	17.75	3.25	18.25	3.75	19.75	3.5	19.25	3.5	9.25	+7.5	9.25	+7.5
Lorain, O. N3	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Sharon, Pa. M6	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Sparrows Pt., Md. B2	16.75	2.25	17.25	3.75	18.75	2.5	18.75	2.5	8.25	+8.5	8.25	+8.5
Wheatland, Pa. W9	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Youngstown R2, Y1	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5

*Galvanized pipe discounts based on current price of zinc (11.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	40.50	42.50	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.75	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.50	42.50	44.25	53.75	53.75
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates— Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless	....	....	....	....	35.50
302	33.15	36.20	40.30	44.50	37.75
304	35.40	38.80	43.15	47.65	....
304-L	38.35	41.60	45.90	50.15	55.50
316	43.55	47.60	52.70	57.85	....
316-L	43.85	48.10	53.40	58.75	....
316-Cb	34.90	37.95	42.10	46.40	44.75
321	37.05	41.25	46.45	51.70	54.25
347	27.55	29.20	33.15	37.95	....
405	27.00	28.70	32.65	36.55	....
410	27.00	28.70	32.65	36.55	....
430	47.28	57.90	68.50	79.20	....
Inconel	40.00	50.30	60.65	71.05	....
Nickel	40.30	50.95	61.65	72.50	....
Nickel, Low Carbon	41.70	51.90	62.15	72.40	....
Monel	....	....	....	....	46.00
Copper*					Strip, Carbon Base —Cold Rolled— 10% 33.00
Copper*					Both Sides 39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.755
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50**	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	64.50	65.00	65.50	66.00
Tonawanda,N.Y. W12	64.50	65.00	65.50	66.00
N.Tonawanda,N.Y. T9	....	65.00	65.50	66.00
Boston, deld.	75.79	76.29	76.79	....
Rochester,N.Y., deld.	67.52	68.02	68.52	....
Syracuse,N.Y., deld.	68.62	69.12	69.62	....
Chicago District				
Chicago I-3	64.50	65.00	65.00	65.50
S.Chicago,Ill. R2	64.50	....	65.00	....
S.Chicago,Ill. Y1	64.50	65.00	65.00	....
S.Chicago,Ill. W14	64.50	....	65.00	65.50
Milwaukee, deld.	66.96	67.46	67.46	67.96
Muskegon,Mich., deld.	....	78.83	78.83	....
Cleveland District				
Cleveland R2, A7	64.50	65.00	65.00	65.50
Akron,O., deld.	67.62	68.12	68.12	68.62
Mid-Atlantic District				
Birdsboro,Pa. B10	66.50	67.00	67.50	68.00
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	66.50	67.00	67.50	68.00
New York, deld.	....	73.20	73.70	....
Newark,N.J., deld.	70.52	71.02	71.52	72.02
Philadelphia, deld.	68.38	68.88	69.38	69.88
Troy,N.Y. R2	66.50	67.00	67.50	68.00
Pittsburgh District				
NevilleIsland, Pa. P6	64.50	65.00	65.00	65.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	66.45	66.45	66.98
McKeesRocks,Pa., deld.	....	66.10	66.10	66.63
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	66.76	66.76	67.29
Verona,Trafford,Pa., deld.	66.79	67.32	67.32	67.85
Brackenridge,Pa., deld.	67.10	67.60	67.60	68.13
Midland,Pa. C18	64.50	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	65.00	....
Sharpsville,Pa. S6	64.50	....	65.00	65.50
Youngstown Y1	....	....	65.00	65.50
Mansfield,O., deld.	69.40	....	69.90	70.40
Duluth I-3	64.50	65.00	65.00	65.50
Erie,Pa. I-3	64.50	65.00	65.00	65.50
Everett,Mass. E1	66.00	66.50	67.00	....
Fontana,Calif. K1	72.50	73.00	....	....
Geneva,Utah C11	64.50	65.00	....	....
GraniteCity,Ill. G4	66.40	66.90	67.40	....
Ironton,Utah C11	64.50	65.00	....	....
Minnequa,Colo. C10	66.50	67.00	67.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	64.50	65.00	65.00	65.50
Cincinnati, deld.	71.04	71.54	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.60%, $59.50.
‡Phos. 0.70-0.90%; Phos. 0.30-0.50%, $60.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$105.50
NiagaraFalls,N.Y. P15	105.50
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	72.50
Philadelphia, deld.	80.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	69.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.17§	9.37§	9.83§	....	8.21	8.45	10.23	....	8.59	8.55	10.51
Baltimore	7.88	8.98	9.31	....	8.36	8.53	9.13[3]	14.68	8.75	8.26	9.76
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	8.84	9.88	9.24	60.42	8.89	9.07	....	14.69	9.10	9.18	10.68
Buffalo	7.85	9.00	10.68	....	8.05	8.25	8.70	14.50	8.50	8.50	10.05
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	7.78	9.00	9.65	53.25	7.82	8.07	8.35	14.15	8.20	8.16	9.49
Cincinnati	7.94	9.05	9.65	50.00	8.14	8.38	8.84	14.46	8.74	8.52	9.78
Cleveland	7.78	8.98	9.55	53.43	7.92	8.16	8.60	14.24	8.57	8.39	9.72
Denver	9.70	11.30	12.49	....	9.80	9.95	10.65	18.89	9.80	9.70	11.40
Detroit	8.03	9.25	10.00	59.50	8.17	8.37	8.70	14.41	8.74	8.51	9.74
Erie, Pa.	7.85	9.00	9.60[10]	....	7.95	8.20	8.70[10]	....	8.50	8.35	9.75
Houston	8.80	9.75	10.99	....	7.75	8.05	9.15	15.00	8.00	8.80	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.10	12.30	11.25	57.45	9.15	9.20	12.10	15.50	9.15	9.65	11.80
Milwaukee	7.93	9.13	9.93	....	7.95	8.20	8.58	14.28	8.41	8.29	9.62
Moline, Ill.	8.13	9.35	10.05	....	8.17	8.42	8.70	....	8.55	8.51	...
New York	8.45	9.66	10.21	60.20	8.90	9.01	....	14.59	8.91	9.01	10.31
Norfolk, Va.	8.05	...	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.15	9.07	10.24	50.69	8.82	8.71	9.31	14.51	8.70	8.68	9.70
Pittsburgh	7.78	8.99	10.00	50.00	7.92	8.07	8.60	14.15	8.20	8.16	9.49
Portland, Oreg.	9.20	11.20	11.55	55.20	11.05‡‡	9.35	13.80	14.60	9.35	9.00	12.20
Richmond, Va.	8.00	...	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.14	9.34	10.16	73.36	8.19	8.43	8.96	14.51	8.67	8.52	9.86
St. Paul	8.39	9.59	10.26	....	8.43	8.68	9.21	....	8.94	8.90	10.10
San Francisco	9.05	10.40	10.50	53.45	9.05	9.15	12.55	15.60	9.15	9.30	11.55
Seattle	9.55	10.70	11.65	55.20	9.55	9.50	13.40	15.85	9.35	9.30	11.70
Spokane, Wash.	9.55	10.70	11.65	....	9.55	9.50	13.40	16.60	9.35	9.30	11.70
Washington	8.48	9.58	....	....	9.06	9.13	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 11.00c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **½-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle; 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—400 to 999 lb; [5]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Hukleman, Olive Hill, Ky., Athens, Troup, Tex., Beach Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Philadelphia, $137; Woodbridge, N.J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $100; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅛-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $72.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60% $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34-$35; Mexican, all-rail, duty paid, $27-$27.75; barge, Brownsville, Tex., $27.75-$29.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, dried. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	*32.00-33.00*

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$3.10-3.60
60-65%	3.60-3.80

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish:	
Deld. east of Mississippi river, ocean bags 23,000 lb and over	10.50
F.o.b. Riverton or Camden, N.J., west of Mississippi river	9.50
Sponge Iron, domestic, 98 + % Fe:	
Deld. east of Mississippi river, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi river	9.50
Sponge Iron, Canadian:	
F.o.b. shipping point	9.50
Electrolytic Iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade. 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atom.zed, 500 lb drum, fr'ght allowed	
Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	34.30-43.00†
Bronze, 5000-lb lots	52.80-57.20†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.065
Nickel-Silver, 5000-lb lots	52.90-57.20†
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	44.50-52.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	18.50-31.70‡
Tungsten:	Dollars
Melting grade, 99% 60 to 2000 mesh:	
1000 lb and over	4.00
Less than 1000 lb	4.15
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$57.75
2⅛	30	37.25
3	40	35.25
4	40	33.25
5⅛	40	33.00
6	60	33.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	33 78
Buffalo, ovens	30 50
Camden, N. J., ovens	29 50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	29 27
Kearny, N.J., ovens	29 75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29 75
Chicago, deld.	33.14
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.13	$7.13	$7.13	$7.36
Bar Size Angles	6.77	6.77	6.77	7.00
Structural Angles	6.77	6.77	6.77	7.00
I-Beams	7.17	7.17	7.17	7.41
Channels	7.17	7.17	7.17	7.41
Plates (basic bessemer)	9.00	9.00	9.00	9.30
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.62	26.62	26.62	27.77
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.95	6.95	6.95	7.30
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O.H. Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	8.38	8.38	8.38	8.58

†Per 82-lb, net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

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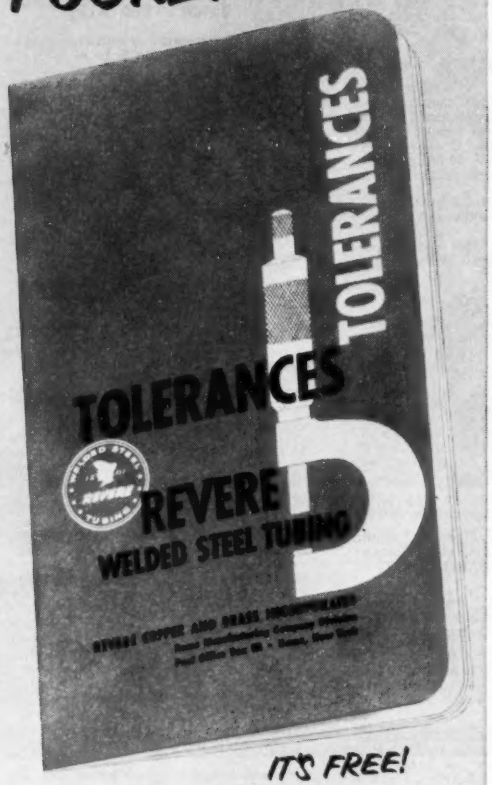

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Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton. Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa., Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any pont east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered, Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, SM x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c: No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; Freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo. in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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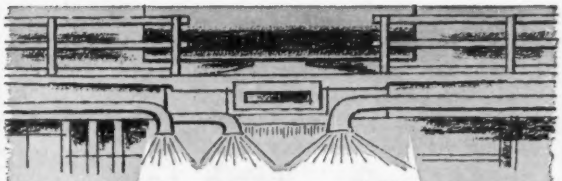

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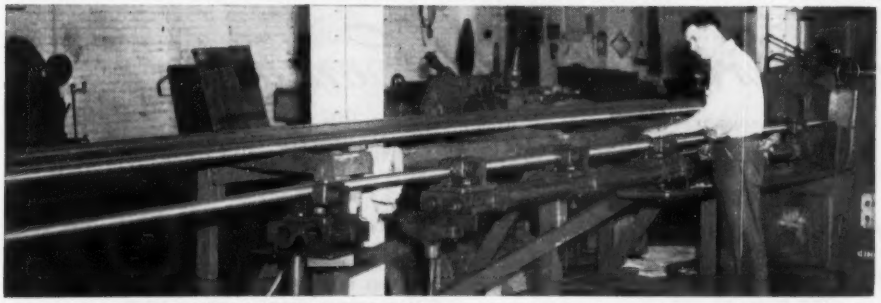

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Scrap Prices Are Leveling Out

Advance temporarily halted at leading centers and STEEL's index on open hearth grades marks time at $55.67. Demand less pressing as vacations near

Scrap Prices, Page 180

Philadelphia—The domestic market on open-hearth scrap is unchanged. District mills are marking time. The undertone is strong with increasing buying for export at higher levels. If district mills were to compete with exporters at present, they would have to boost their buying prices about $2 a ton.

Boston—Brokers are paying $1 more for heavy melting steel grades. The upward trend in prices is somewhat slower, although short shoveling turnings are up $2 a ton. Strong scrap prices are based on shipments to Pennsylvania furnaces against old orders.

New York — Brokers' buying prices are unchanged except for a $2 advance on unstripped motor blocks to $37-$38 and a slight reduction in type 410 stainless sheets, clips and solids to $50-$55.

Sustaining the market for some of the open-hearth grades is a strong demand for export.

Cleveland—Approach of the vacation season is putting a damper on new buying of scrap. Few steel mills and foundries will take in scrap during the suspensions. Despite the sluggish market, prices are firm. Higher prices have stimulated the flow of tonnage to dealers' yards. Supplies are not too plentiful, though, and brokers find it necessary to pay above the quoted market to obtain material for commitments.

Chicago—Scrap prices appear to be reaching a leveling off point following a six-week surge that has added around $15 a gross ton to quotations for steelmaking grades. A declining steelmaking rate and prospects that the year's low point will be established in the next two months are the chief causes. But the market is strong, based on the long-term outlook. Also responsible for some of the strength: Brokers have been buying choice material to fill old orders at prices higher than consumers paid.

Pittsburgh—The market is firm. Cut structurals and electric furnace bundles went up last week. Machine shop turnings advanced $2 a ton despite sluggish demand.

St. Louis — Scrap supplies are dwindling. Demand from outside the district is strong. Shipments of industrial material are slightly better, but the tonnage of rural scrap coming to the market is dropping steadily. Prices of heavy melting steel advanced $1 to $5 a ton last week.

Detroit — Scrap prices are unchanged, but dealers and brokers think they will move up another $1 this week when the auto lists close. The outlook for the next two months is for a fairly stable market. Smaller auto output will mean less scrap generation. Mills should have sufficient stocks to carry their operating schedules through to the end of the summer period.

Buffalo—The market undertone is strong. Prices on most mill grades are governed by large orders placed around the beginning of the month. They are now being filled by brokers.

The consumer price for No. 1 heavy melting is $47, but dealers report this grade is bringing $48-$49 when shipped to Pittsburgh. Machine shop turnings are $34, up $3 a ton. A $4 jump was posted on short shoveling turnings at $37. Mixed borings and turnings and cast iron borings are up $3.

Youngstown — The local scrap market is stronger. One mill bought No. 1 heavy melting at $55, and No. 1 bundles at $54. Another purchased No. 2 heavy melting at $50, and some bundles at $47.

Cincinnati—Prices are stabilizing here following two weeks in which the market moved sharply upward. There is no new mill buying at present. Brokers say it is difficult to purchase tonnage from dealers who are expecting further rise.

Birmingham — Scrap continues

(*Please turn to page* 185)

This announcement is neither an offer to sell, nor a solicitation of offers to buy, any of these securities. The offering is made only by the Prospectus.

New Issue

June 18, 1957

484,276 Shares

The Timken Roller Bearing Company

Common Stock

(Without Par Value)

The Company is offering to the holders of its Common Stock the right to subscribe for the above shares at the Subscription Price of $40 per share. The Subscription Offer will expire at 3:30 P.M., Eastern Daylight Saving Time, on July 1, 1957. Both during and after the expiration of the subscription period the several underwriters may offer Common Stock at prices and on terms as set forth in the Prospectus.

Copies of the Prospectus may be obtained in any State in which this announcement is circulated from only such of the underwriters as may legally offer these securities in compliance with the securities laws of such State.

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Stone & Webster Securities Corporation — White, Weld & Co.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, June 19, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 19	$55.67
June 12	55.67
May Avg.	45.75
June 1956	46.04
June 1952	42.63

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	56.00-57.00
No. 2 heavy melting	50.00-51.00
No. 1 factory bundles	62.00-63.00
No. 1 dealer bundles	56.00-57.00
No. 2 bundles	47.00-48.00
No. 1 busheling	56.00-57.00
Machine shop turnings	*34.00-35.00*
Mixed borings, turnings	*34.00-35.00*
Short shovel turnings	*38.00-39.00*
Cast iron borings	*38.00-39.00*
Cut structurals:	
2 ft and under	*62.00-63.00*
3 ft lengths	*61.00-62.00*
Heavy turnings	*47.00-48.00*
Punchings & plate scrap	*61.00-62.00*
Electric furnace bundles	*61.00-62.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	34.00-35.00
No. 1 machinery cast	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt	*60.00-61.00*
Rails, 2 ft and under	71.00-72.00
Rails, 18 in. and under	72.00-73.00
Rails, random lengths	*68.00-69.00*
Railroad specialties	*69.00-70.00*

Stainless Steel Scrap

18-8 bundles & solids	300.00-310.00
18-8 turnings	190.00-210.00
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	51.00-52.00
No. 1 factory bundles	54.00-55.00
No. 2 heavy melting	46.00-47.00
No. 1 bundles	51.00-52.00
No. 2 bundles	43.00-44.00
No. 1 busheling	51.00-52.00
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut foundry steel	49.00-50.00
Cut structurals, plates 2 ft and under	58.00-59.00
Low phos. punchings & plate	54.00-55.00
Alloy free, short shovel turnings	26.00-27.00
Electric furnace bundles	54.00-55.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	41.00-42.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	73.00-74.00
Rails, 18 in. and under	74.00-75.00
Rails, random lengths	68.00-69.00
Cast steel	63.00-64.00
Railroad specialties	65.00-66.00
Uncut tires	63.00-64.00
Angles, splice bars	65.00-66.00
Rails, rerolling	71.00-72.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	300.00-310.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	54.00-55.00
No. 2 heavy melting	49.00-50.00
No. 1 bundles	54.00-55.00
No. 2 bundles	46.00-47.00
No. 1 busheling	54.00-55.00
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	57.00-58.00
Electric furnace bundles	57.00-58.00

Railroad Scrap

No. 1 R.R. heavy melt	61.00-62.00

CHICAGO

No. 1 hvy melt., indus.	55.00-56.00
No. 1 hvy melt., dealer	52.00-53.00
No. 2 heavy melting	47.00-48.00
No. 1 factory bundles	58.00-59.00
No. 1 dealer bundles	53.00-54.00
No. 2 bundles	*43.00-44.00*
No. 1 busheling, indus.	*55.00-56.00*
No. 1 busheling, dealer	*52.00-53.00*
Machine shop turnings	*33.00-34.00*
Mixed borings, turnings	*35.00-36.00*
Short shovel turnings	*35.00-36.00*
Cast iron borings	*35.00-36.00*
Cut structurals, 3 ft	*57.00-58.00*
Punching & plate scrap	*58.00-59.00*

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	45.00-46.00
Unstripped motor blocks	*36.00-37.00*
Clean auto cast	*52.00-53.00*
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt	*59.00-60.00*
R.R. malleable	*62.00-63.00*
Rails, 2 ft and under	*75.00-76.00*
Rails, 18 in. and under	*76.00-77.00*
Angles, splice bars	*67.00-68.00*
Rails, rerolling	*74.00-75.00*

Stainless Steel Scrap

18-8 bundles & solids	315.00-320.00
18-8 turnings	215.00-220.00
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	33.00-34.00
No. 1 bundles	46.00-47.00
No. 2 bundles	33.00-34.00
No. 1 busheling	45.00-46.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	56.00-57.00

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	41.00
Stove plate	41.00
Heavy breakable	36.00
Unstripped motor blocks	28.00
Clean auto cast	48.00
Malleable	52.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*45.50*
No. 2 heavy melting	*43.00*
No. 1 bundles	*45.50*
No. 2 bundles	*38.00*
No. 1 busheling	*45.50*
Machine shop turnings	30.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	40.00
Heavy breakable cast	40.00
Unstripped motor blocks	40.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	41.00

Railroad Scrap

No. 1 R.R. heavy melt	*54.00*
Rails, 18 in. and under	*74.00*
Rails, rerolling	*71.00*
Rails, random lengths	*67.00*
Angles, splice bars	*62.00*

PHILADELPHIA

No. 1 heavy melting	56.00-57.00
No. 2 heavy melting	48.00-49.00
No. 1 bundles	58.00
No. 2 bundles	48.00-50.00
No. 1 busheling	58.00
Electric furnace bundles	58.00-59.00
Mixed borings, turnings	40.00†
Short shovel turnings	42.00
Machine shop turnings	39.00
Heavy turnings	52.00-53.00
Structurals & plate	*59.00-61.00*
Couplers, springs, wheels	*66.00*
Rail crops, 2 ft & under	70.00-72.00

Cast Iron Grades

No. 1 cupola	46.00
Heavy breakable cast	55.00
Malleable	62.00
Drop broken machinery	57.00-58.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	53.00-55.00
No. 2 heavy melting	43.00-45.00
No. 1 bundles	53.00-55.00
No. 2 bundles	42.00-43.00
Machine shop turnings	29.00-29.50
Mixed borings, turnings	29.00-29.50
Short shovel turnings	31.00-32.00
Low phos. (structural & plate)	55.00-56.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Unstripped motor blocks	*37.00-38.00*
Heavy breakable	46.00-47.00

Stainless Steel

18-8 shets, clips solids	280.00-290.00
18-8 borings, turnings	180.00-190.00
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	*50.00-55.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*35.00-36.00*
No. 1 busheling	42.00-43.00
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*30.00-31.00*
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	46.00-47.00
No. 2 bundles	36.00-37.00
No. 1 busheling	46.00-47.00
Mixed borings, turnings	*35.00-36.00*
Machine shop turnings	*33.00-34.00*
Short shovel turnings	*36.00-37.00*
Cast iron borings	*35.00-36.00*
Low phos.	51.00-52.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*45.00-46.00*
No. 1 machinery	*50.00-51.00*

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	46.00-47.00
No. 2 bundles	39.00-40.00
No. 1 busheling	46.00-47.00
Machine shop turnings	30.00-31.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	33.00-34.00
Cast iron borings	28.00-29.00
Low phos. 18 in.	54.00-55.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt	52.00-53.00
Rails, 18 in. and under	70.00-71.00
Rails, random lengths	62.00-63.00

BIRMINGHAM

No. 1 heavy melting	48.00-49.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	48.00-49.00
No. 2 bundles	36.00-37.00
No. 1 busheling	48.00-49.00
Cast iron borings	*28.00-29.00*
Short shovel turnings	*38.00-39.00*
Machine shop turnings	*37.00-38.00*
Bar crops and plates	*58.00-59.00*
Structurals & plate	*57.00-58.00*
Electric furnace bundles	49.00-50.00
Electric furnace:	
3 ft and under	47.00-48.00
2 ft and under	48.00-49.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*51.00-52.00*
Stove plate	*49.00-50.00*
Unstripped motor blocks	*43.00-44.00*
Charging box cast	34.00-35.00
No. 1 wheels	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt	53.00-54.00
Rails, 18 in. and under	*65.00-66.00*
Rails, rerolling	*66.00-67.00*
Rails, random lengths	*59.00-60.00*
Angles, splice bars	*59.00-60.00*

SEATTLE

No. 1 heavy melting	45.00
No. 2 heavy melting	42.00
No. 1 bundles	42.00
No. 2 bundles	26.00
Machine shop turnings	28.00
Mixed borings, turnings	28.00
Electric furnace No. 1	52.00

Cast Iron Grades

No. 1 cupola	48.00
Heavy breakable cast	45.00
Unstripped motor blocks	37.50
Stove plate (f.o.b. plant)	37.00

LOS ANGELES

No. 1 heavy melting	46.00
No. 2 heavy melting	43.00
No. 1 bundles	45.00
No. 2 bundles	33.00
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	31.00
Cut structural and plate, 1 ft and under	57.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	52.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00

SAN FRANCISCO

No. 1 heavy melting	48.00
No. 2 heavy melting	43.00
No. 1 bundles	47.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	*34.00*
Cut structurals, 3 ft	*56.00*

Cast Iron Grades

No. 1 cupola	53.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	48.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

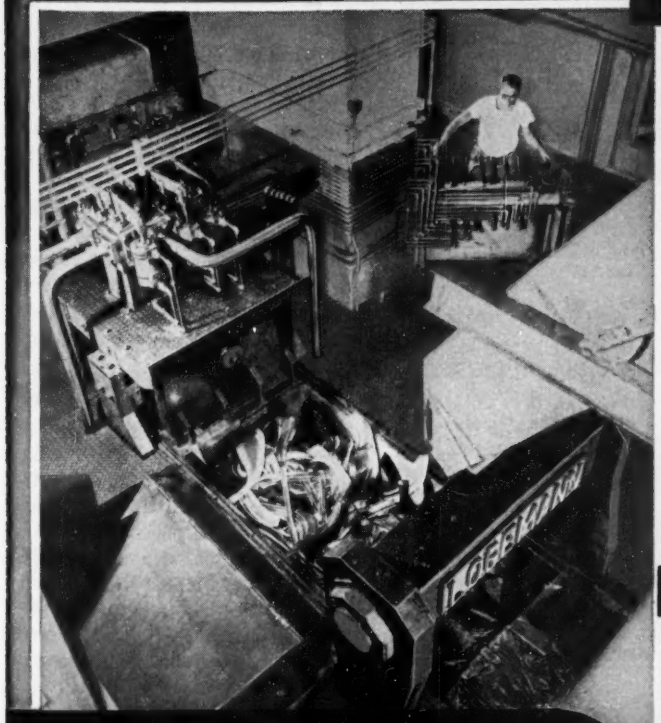
HAMILTON, ONT.

No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	35.00
Mixed borings, turnings	19.00
Busheling, new factory:	
Prepared	43.00
Unprepared	37.00
Short steel turnings	30.00
Rails, rerolling	49.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.



LOGEMANN Metal Balers

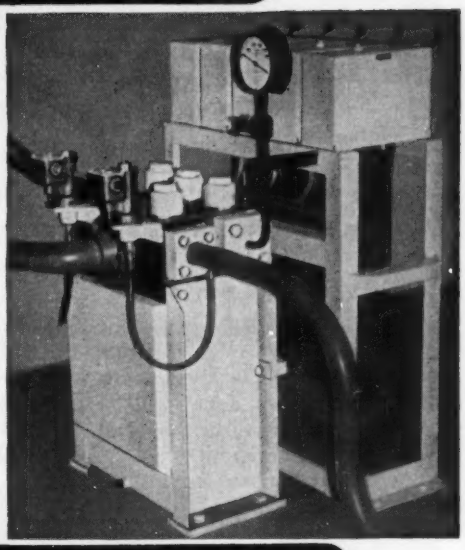
. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

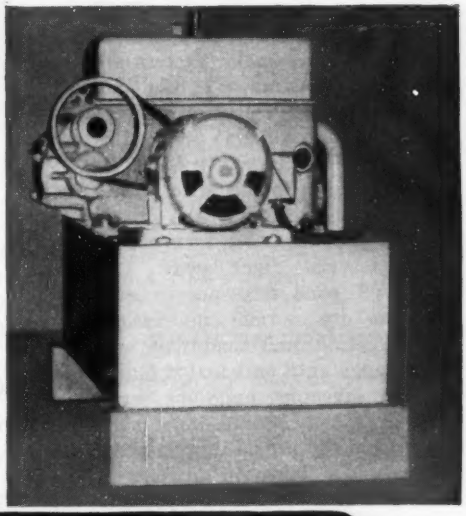
LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.

LOGEMANN



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Copper Prices Fall

Slumping sales and dip in foreign prices are blamed as primary quotation hits lowest level since 1953. Zinc down to 10.5 cents. Further drop in lead prices expected

Nonferrous Metal Prices, Pages 184 & 185

DOMESTIC COPPER prices have been reduced from 32 cents a pound to 29.25 cents for primary. Phelps-Dodge Corp. announced the 2.75 cent a pound price slash (June 19) and was followed by Kennecott Copper Co. on the same day. Other producers were expected to follow suit.

At the same time, American Smelting & Refining Co. cut the price of custom smelted copper from 30 to 29 cents a pound. Other custom smelters indicated they would drop prices to this level.

This marks the lowest primary copper quotation since February, 1953, when the price was 25.37 cents a pound.

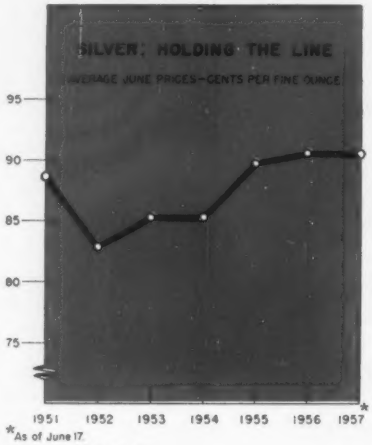
Factors—Two major factors are behind the price dip: 1. Slumping sales because buyers (such as brass mills and ingotmakers) are operating on rock bottom inventories. 2. Recent slashes in the price of foreign produced copper.

Most producers don't expect an order unsurge right away. One reason: The industry appears headed into its normal midsummer slump period, and conditions may not change until anticipated fourth quarter inventory build-ups begin.

There's a strong feeling among some industry people that an order upsurge will begin in August. If demand is heavy, there's a possibility prices would go up. One thing's certain: Industry observers feel there's little chance of a further price drop. Some mines can't produce copper profitably at a price lower than the present quotation.

Cutbacks? — It's possible more production cutbacks will be announced shortly. Hand-to-mouth consumer buying has pushed unsold stocks of refined copper to 155,365 tons. Domestic refined production has been going up since January when 139,150 tons were produced. In May, 151,045 tons were put out, bringing total U.S. production for the first five months of 1957 to 712,460 tons.

Since January, domestic producers have reduced crude production by 9000 tons a month. But the industry is still faced with a potential surplus of 100,000 tons by year end. Even a strong buying upsurge would not take up all the surplus.



*As of June 17
Source: Handy & Harman.

Silver: Minor Fluctuations

June is traditionally a month of mild fluctuations for silver. High for the month was 90.875 cents a fine ounce. It went to a low of 90.125 and stands now at 90.25 (June 18). But over the long pull, there is a marked stability (see chart).

According to the trade, the fluctuation was due to a decline in demands of domestic and European buyers. Such lack of interest usually precedes summer vacations.

More Aluminum for Autos

Ground has been broken for Reynolds Metals Co.'s $88 million aluminum reduction plant at Massena, N. Y. When it begins operation in 1959, the plant will have an estimated annual capacity of 100,000 tons of primary aluminum.

General Motors Corp.'s Chevrolet Motor Division will build a parts foundry (also pegged for completion in 1959) near the Reynolds plant in Massena. The $12 million installation initially will make aluminum parts for engines and transmissions, taking "hot metal" from Reynolds.

The co-op project was explained this way by Reynolds' president, Richard S. Reynolds Jr: "About 40 lb of aluminum are used in each automobile today. In some cars, the amount runs as high as 200 lb. Our market research studies tell us that by 1960 the total amount of aluminum in passenger cars will reach at least 300,000 tons, or twice as much as the automobile industry consumed in 1956."

Kaiser Aluminum & Chemical Corp. has ordered 24 railroad gondola cars with all-welded aluminum bodies to supplement its fleet

NONFERROUS PRICE RECORD

	Price June 19	Last Change	Previous Price	May Avg.	Apr. Avg.	June, 1956 Avg.
Aluminum	27.10	Aug. 10, 1956	25.90	27.100	27.100	25.900
Copper	29.00–29.25	June 18, 1957	30.00–32.00	31.087	31.598	43.000
Lead	13.80	June 11, 1957	14.80	15.185	15.800	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	33.750
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	98.25	June 14, 1957	98.375	98.341	99.276	94.611
Zinc	10.50	June 18, 1957	11.00	11.923	13.500	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

of 35 such cars. (They're used in the firm's bauxite mining operations on Jamaica.) Pullman-Standard Mfg. Co. has the order.

Keep an eye on aluminum prices. At least two major producers have labor contracts that call for additional wage packages ranging from 11.5 to 15 cents an hour effective Aug. 1. Industry observers look for a ½ to 1 cent a pound price bump soon after.

Too Much Lead and Zinc

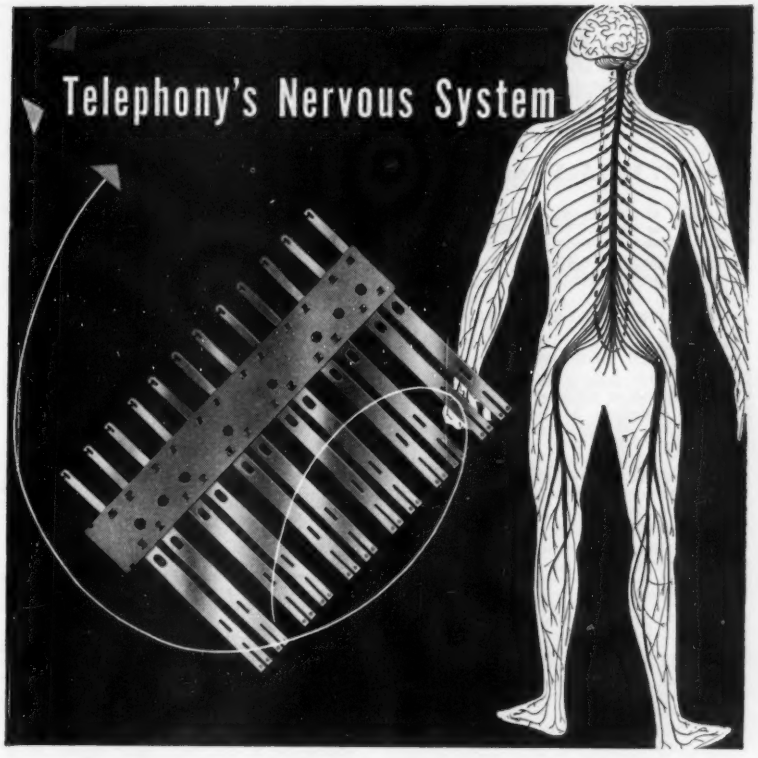
The price of zinc dropped another half cent last week to 10.5 cents a pound, East St. Louis. The reason is easy to find: Too much metal and not enough demand. For the same reason, lead was expected to follow closely with a similar cut. Unlike most recent cuts, the latest action came in anticipation of a drop in the European market instead of after.

The only remedy for the industry's ill, according to one spokesman, is to cut production. With lead and zinc overflowing the government's stockpile, it's only a matter of time before that support loses its strength. The recently revised barter program is so tied up by restrictions that metals men say it no longer is a practical device to support the market.

Congress is studying proposals to levy additional tariffs on lead and zinc imports. But most metals men don't look for any concrete action to be taken until next year.

Market Memos

- Production of domestic bauxite was 368,209 tons during the first quarter, 13 per cent below the mark of the fourth quarter last year, says the U.S. Bureau of Mines.
- Copper sulphate shipments hit 7976 tons in April, a 14 per cent increase over those in March, says the Interior department. Production increased to 6884 tons.
- Formation of a new company, Hudson Ungava Nickel Mines Ltd., has been announced. Management will be provided by the Rio Tinto Mining Co. of Canada Ltd.
- It's said that $20 million is being spent for research on columbium. Known deposits of this metal are said to be sufficient to satisfy the current rate of usage indefinitely.



. . . relies on "neurons" of Seymour Nickel Silver

Dial telephones carry your voice to the ends of the earth through an intricate electrical network which closely resembles the human nervous system. Seymour nickel silver plays a key role in modern communications as part of the North Electric Company "Crossbar Switching System" which automates independent telephone exchanges.

Tiny, neuron-like contacts on North Crossbar switch assemblies rely on flat springs of even-tempered Seymour nickel silver for *trillions* of "makes-and-breaks".

Easy to work, corrosion-resistant and possessing excellent conductivity, Seymour nickel silver has an enviable reputation for quality and uniformity among hundreds of manufacturers who say: — "Specify SEYMOUR. You KNOW it's good!"

Perhaps Seymour metallurgists can help solve your materials problems. Tell us your requirements.

Long distance telephone operators link distant points to the North Crossbar System in Seymour, Indiana.

THE SEYMOUR MANUFACTURING COMPANY
3 FRANKLIN STREET
SEYMOUR, CONNECTICUT

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 241, 30.50; No. 356, 28.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 29.25 deld. Conn. valley; 29.25 deld. Midwest; custom smelters, 29.00; lake, 29.25 deld; fire refined, 29.00 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9% $2.25 per troy oz.

Iridium: $100-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex., 13 in. sticks, 59.00 f.o.b. Madison Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-100 per troy oz, nom.

Palladium: $23-24 per troy oz.

Platinum: $89-95 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.25 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Rod, $58.06 per lb; sheet, $45.36 per lb.

Tellurium: $1.60-1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot and prompt, 98.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.60.

Zinc: Prime Western, 10.50; brass special, 10.75; intermediate, 11.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.85; special high grade, 11.25 deld. Die casting alloy ingot No. 3, 15.25; No. 2, 16.25; No. 5, 15.75 deld.

Zirconium: Sponge, commercial grade, $10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 22.75-28.25, No. 12 foundry alloy (No. 2 grade), 20.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.25-24.50; 13 alloy, 0.60 Cu max., 24.25-24.50; 195 alloy, 23.75-25.25; 108 alloy, 21.25-22.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.50; grade 2, 20.75; grade 3, 19.75; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 30.50; tin bronze, No. 225, 40.00; No. 245, 34.50; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 25.00; manganese bronze, No. 421, 28.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.83-1.86, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 37.355; l.c.l., 37.98. Weatherproof, 30,000-lb lots, 37.78; l.c.l., 38.53. Magnet wire deld., 15,000 lb or more, 44.68; l.c.l., 45.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-12.00; wire, $7.50-11.50; forging billets, $6.00-8.10; hot-rolled and forged bars, $6.15-8.40.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 21.00; plates, 19.50.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	103	135
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.50-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. width or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-Finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
Rolled				
1.125-1.500	55.20	53.90	59.00	56.10
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅛	$18.45	2	$ 57.00
1	29.00	4	157.20
1½	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	43.10-44.60	57.80-61.80
12-14	43.40-44.80	58.40-62.70
15-17	43.60-45.40	59.60-64.30
18-20	44.10-45.80	61.50-66.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.0.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 9.50-10.00; borings and turnings, 6.50-

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES f

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.13b	51.36c	....	54.32	28.000	28.000	27.250
Yellow Brass	46.85	34.97d	47.39	49.76	21.250	21.000	19.375
Low Brass, 80%	49.80	49.74	50.34	52.61	23.750	23.500	23.000
Red Brass, 85%	50.84	50.78	51.38	53.65	24.750	24.500	24.000
Com. Bronze, 90%	52.43	52.42	53.02	55.04	25.750	25.500	25.500
Manganese Bronze	54.65	48.75	59.25	....	19.750	19.500	19.000
Muntz Metal	48.99	44.80	....	....	20.000	19.750	19.250
Naval Brass	50.91	45.22	57.97	54.32	19.750	19.500	19.000
Silicon Bronze	58.60	57.79	58.64	60.68e	27.375	27.125	26.375
Nickel Silver, 10%	63.56	65.89g	65.89	....	27.750	27.750	13.750
Phos. Bronze, A-5%	73.17	73.67	73.67	74.85	28.875	28.625	27.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.00; crankcases, 9.50-10.00; industrial castings, 9.50-10.00.

Copper and Brass: No. 1 heavy copper and wire, 22.50-23.00; No. 2 heavy copper and wire, 21.00-21.50; light copper, 19.25-19.75; No. 1 composition red brass, 19.75-20.25; No. 1 composition turnings, 19.25-19.75; yellow brass turnings, 12.00-12.25; new brass clippings, 18.00-18.50; light brass, 12.00-12.50; heavy yellow brass, 14.00-14.50; new brass rod ends, 15.50-16.00; auto radiators, unsweated, 15.00-15.50; cocks and faucets, 16.50-17.00; brass pipe, 17.00-17.50.

Lead: Heavy 9.50-10.00; battery plates, 5.00-5.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 12.00-12.50.

Monel: Clippings, 45.00-48.00; old sheets, 45.00-48.00; turnings, 35.00-38.00; rods, 45.00-48.00.

Nickel: Sheets and clips, 80.00-90.00; rolled anodes, 80.00-90.00; turnings, 65.00-75.00; rod ends, 80.00-90.00.

Zinc: Old zinc, 3.00-3.50; new die-cast scrap, 2.75-3.00; old die-cast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.00; 3003 clippings, 16.50-17.00; 6151 clippings, 16.50-17.00; 5052 clippings, 16.50; 2014 clippings, 15.50-16.50; 2017 clippings, 15.50-16.50; 2024 clippings, 15.50-16.50; mixed clippings, 15.00-15.50; old sheets, 13.50; old cast, 13.50; clean old cable (free of steel), 16.00-16.50; borings and turnings, 14.00-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 54.00; light scrap, 49.00; turnings and borings, 34.00.

Copper and Brass: No. 1 heavy copper and wire, 25.00; No. 2 heavy copper and wire, 23.25; light copper, 21.00; refinery brass (60% copper) per dry copper content, 23.25.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 25.00; No. 2 heavy copper and wire, 23.25; light copper, 21.00; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 17.00; yellow brass turnings, 16.00; radiators, 17.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 50.29; oval, 49.42, 5000-10,000 lb; electrodeposited, 39.25, 2000-5000 lb lots; cast, 44.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 101.50; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 116.50; 200-499 lb, 115.00; 500-999 lb, 114.50; 1000 lb or more, 114.00.

Zinc: Balls, 18.59; flat tops, 18.25; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.
Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-1000 lb, 77.50.

Copper Sulphate: 100 lb, 24.35; 200 lb, 21.35; 300 lb, 20.35; 400 lb, 19.85; 500 lb, 18.35; 2000 lb, 16.10; 6000 lb, 15.85; 12,000 lb, 15.60, f.o.b. shipping point.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400 lb, 35.50; 5000 lb, 33.50; 29,000 lb, 33.00; 36,000 lb, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80, f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 77.40; 100-600 lb, 68.20; 700-1900 lb, 65.50; 2000-9900 lb, 63.60; 10,000 lb or more, 62.30.

Stannous Chloride (anhydrous): Less than 25 lb, 167.10; 25 lb, 132.10; 100 lb, 117.10; 400 lb, 114.70; 5200-19,600 lb, 102.50; 20,000 lb or more, 90.30.

Stannous Sulphate: Less than 50 lb, 129.80; 50 lb, 99.80; 100-1900 lb, 97.80; 2000 lb or more, 95.80.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

(*Concluded from page* 179)

strong here, but some brokers look for a break in prices around July 1 when many foundries close for summer vacations. Dealers say they are still unable to fully satisfy demand.

San Francisco—Slight shortages of certain grades of steel scrap are reported in this area. They are resulting in the payment of a slight premium for occasional tonnage.

Los Angeles — Dealers report new firmness to the market undertone. Price increases are expected.

Seattle—The tone of the market has changed from bearish to bullish, reflecting higher prices in eastern markets. Local prices are unchanged at $45 for No. 1 heavy melting and $42 for No. 2 heavy melting.

Washington—The embargo on export licenses for heavy scrap to the United Kingdom, Japan and the European Coal & Steel Community is off again. Applied last May, the embargo was lifted June 18 after those countries agreed to hold their imports of heavy U.S. scrap to 13 per cent above last year's tonnages.

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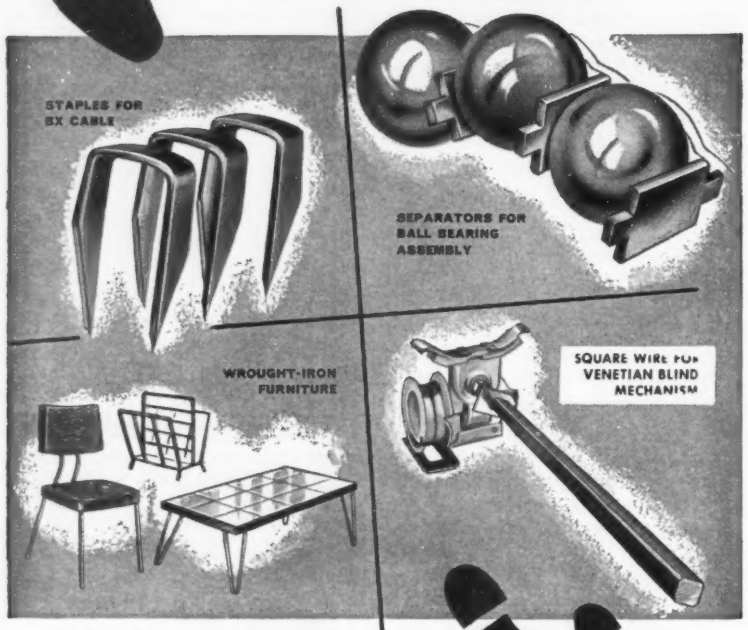
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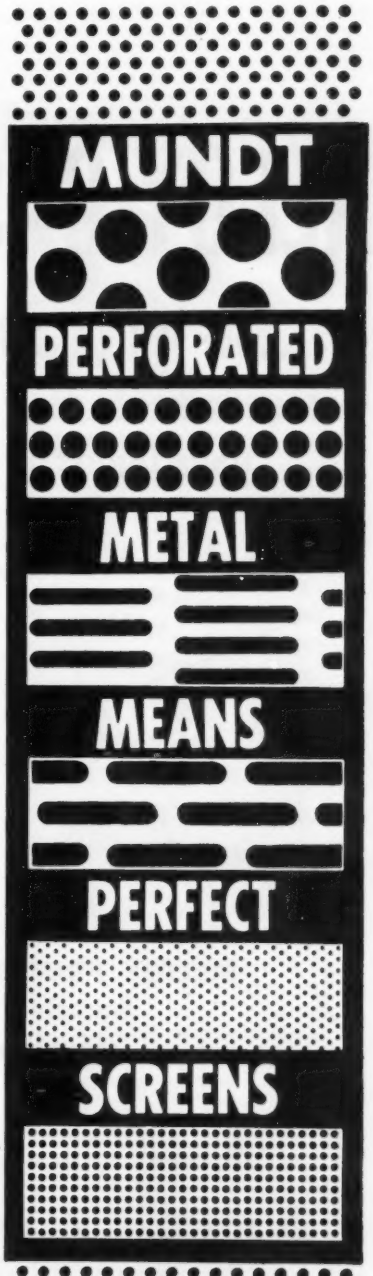

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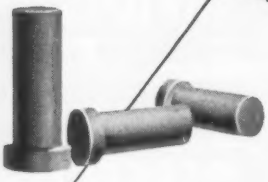

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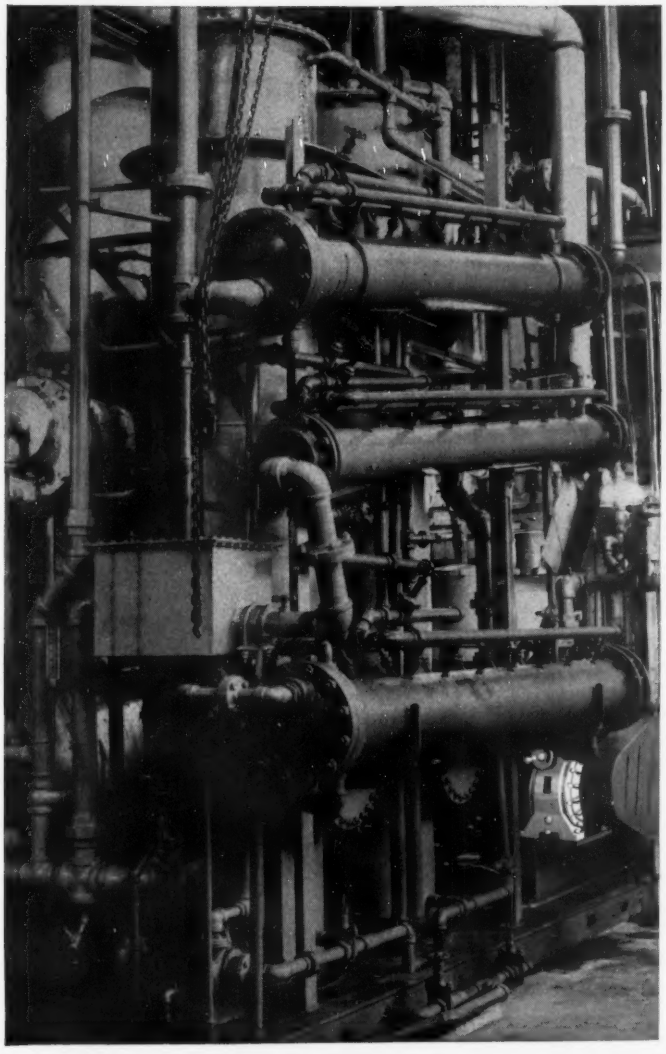
varies gas feed to annealing furnace need



THIS gas blower is part of the monogas system that feeds an annealing furnace. Rate of gas output from the blower is precisely controlled by a Cleveland variable speed drive.

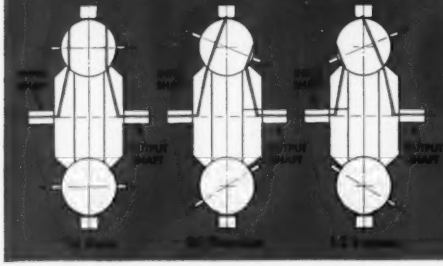
When the gas production rate must be decreased or increased to fit various annealing processes, it is easily regulated by a simple turn of the hand wheel on the drive. To maintain uniform supply of gas at all times, even if pump or compressor output varies, a simple adjustment on the Variator compensates and keeps the production rate steady.

This is one of hundreds of different applications of this unique Cleveland Speed Variator. Engineers and designers have put thousands of units into use on such diverse equipment as cigarette-making machines, textile machinery, metalworking machinery, pharmaceutical equipment, transfer tables, conveyors, testing equipment and experimental machines of many types.

Being infinitely variable, the Cleveland gives stepless speeds over a full 9:1 range—from ⅓ to 3 times input speed. Output speed on this particular application illustrated is adjusted by hand wheel, but could be regulated by either manual or automatic remote control. The Variator is available in 18 sizes, ranging from fractional to 16 hp at 1750 input rpm.

Write for Bulletin K-200 for detailed description with photographs, sectional drawings, rating tables and specifications.

HOW THE CLEVELAND SPEED VARIATOR WORKS



Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts.

Relative speeds of the shafts are adjusted by changing the positioning of axles on which the balls rotate (diagram, right, shows cutaway Variator with hand regulating wheel).

"It's the Drive That's on the Ball."

THE CLEVELAND WORM AND GEAR COMPANY

Speed Variator Division, 3270 East 80th Street, Cleveland 4, Ohio

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